FEBRUARY 1, 1994
VOLUME SEVEN NUMBER EIGHT
SEVEN DOLLARS

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

COVER STORY

Turnover Tales

It Is (Pick One):

- ☐ *The Best of Times*
- ☐ *The Worst of Times*

ALSO INSIDE

How To Cultivate A Business Sponsor

Union Carbide's
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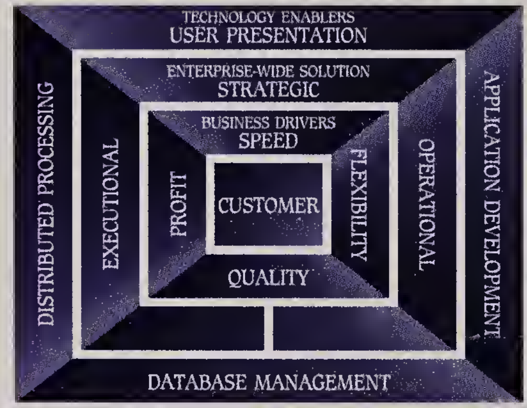

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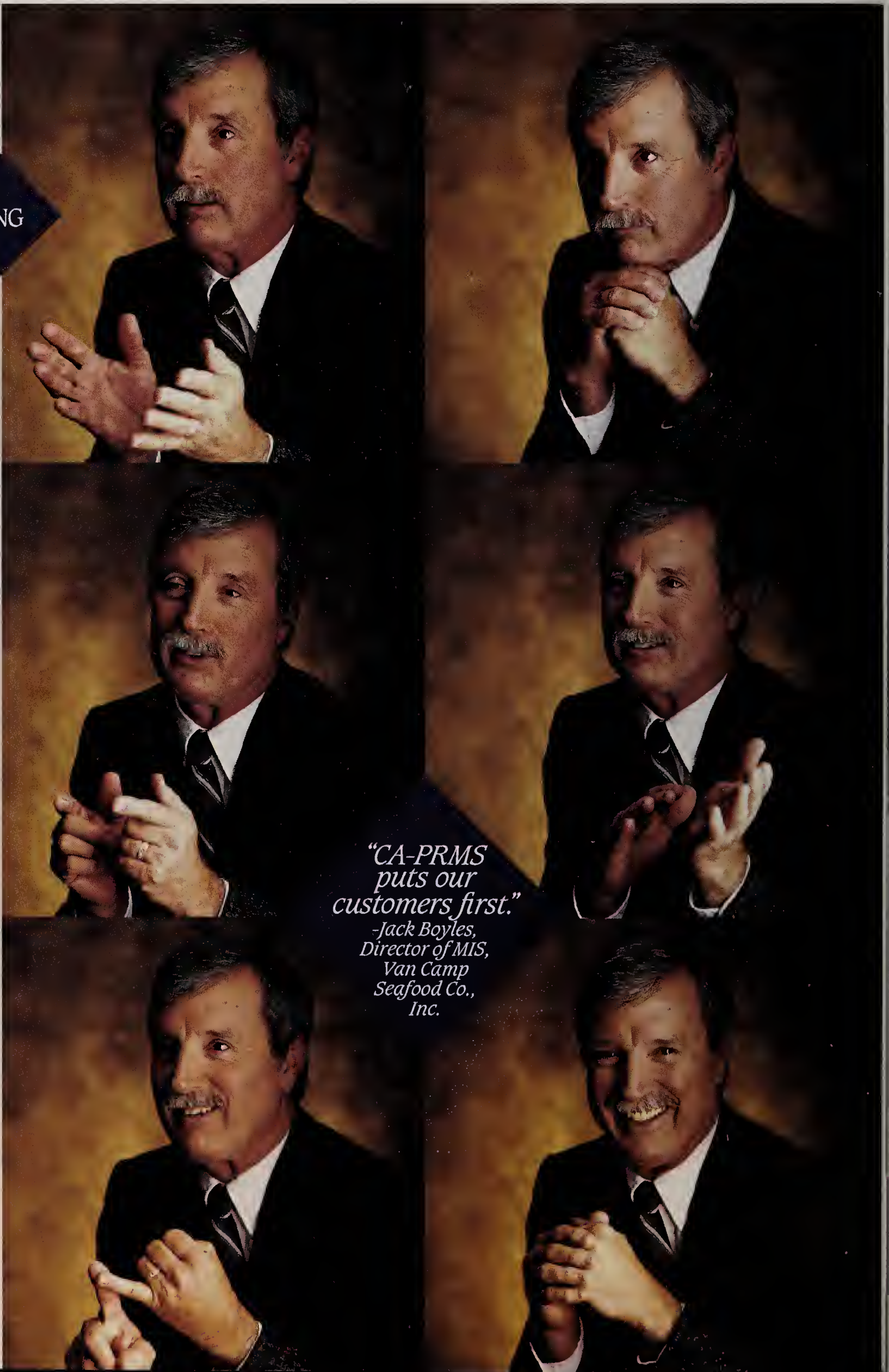

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CIO

VOLUME 7, NUMBER 8

COVER STORY

I.S. CAREERS **40**

The Truth About Turnover

Sure CIO turnover is high, but it's not exactly open season on IS executives. And those who do find themselves out of a job can take comfort in the fact that being fired is not the anathema it once was. *By Mickey Williamson*

Engineering an exit **40**
Cover photo by Kent Hanson

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A Resounding Maybe

In recent months, there's been renewed debate over the so-called productivity paradox. It seems investments in IT are paying off after all. Economist Stephen Roach, a leading critic of IT investment in the service sector, explains where service companies ran amok in the past and how that is changing. *By Carol Hildebrand*

PARTNERSHIPS **48**

How To Create a Business Driver

Ryder CIO Dennis Klinger believes the best IT systems have one thing in common: top-drawer business-unit leadership. Over the years, Klinger has refined a methodology for turning IS skeptics into system sponsors. Then, once he gets their sleeves rolled up, he puts them behind the wheel.... *By Carol Hildebrand*

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OUTLOOK: AN AMBITIOUS AGENDA

Reengineering, client/server and squeezing the budget top CIOs' plans for 1994. *By James A. Champy*

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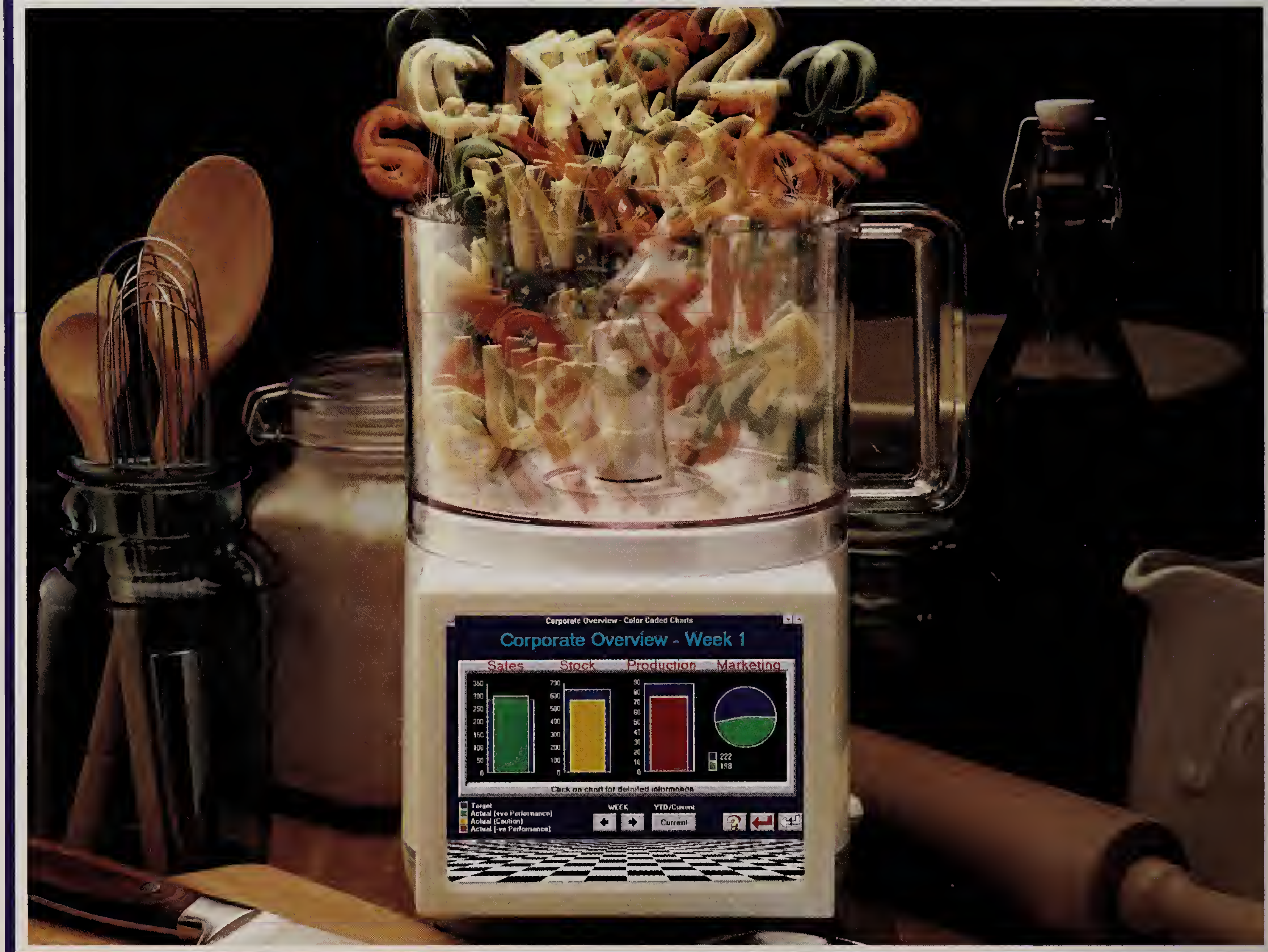

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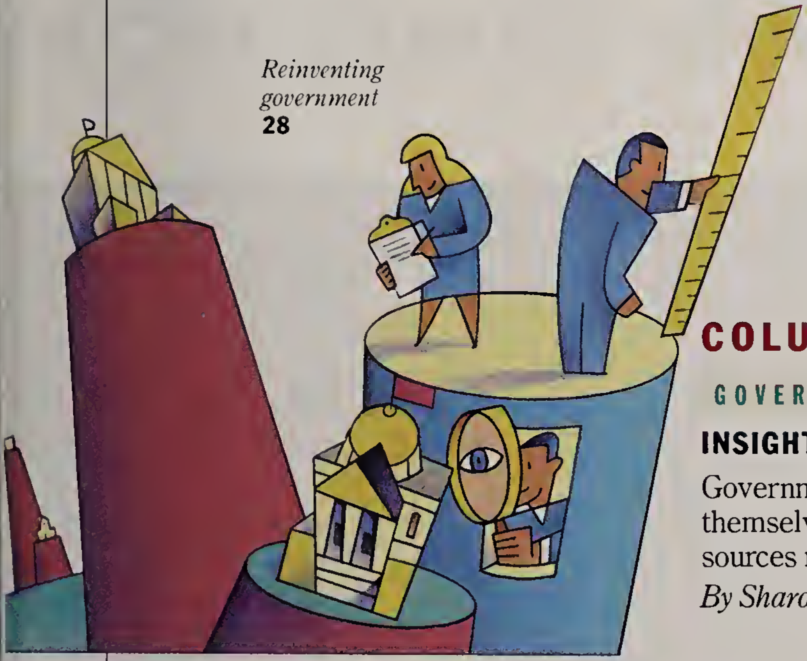

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By Sharon L. Caudle

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By Nora Sherwood Bryan

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WORKING SMART: TRIED AND TRUE

Preventive maintenance requires tracking the location, use and service of equipment in the field; parts inventories; contracts; customer records. When your equipment is used in the diagnosis and treatment of devastating diseases, you'd better get it right.

By Stephen Mills

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The others assumed they were getting true fault tolerance. Yet, nervously hopeful, they still have their doubts.

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Information executives have been criticized for not being in tune with the strategic goals of their companies. Is this why they seem so often to get shown the door? And are the ranks of CIOs really thinning more rapidly than those of other executives on the firing line? Not necessarily.

In "The Truth About Turnover," beginning on Page 40, Contributing Writer Mickey Williamson reports that politics is often the basis for information-executive turnover. Because CIOs provide staff and services to functional areas throughout the organization, maintaining good relationships with many executives is critical to their success. Moreover, some CEOs and top general managers are keen on hacking the IS budget as a cost savings.

Both the Society for Information Management's recent study and the oft-cited Deloitte & Touche survey of turnover find the CIO's tenure to be about five years—significantly longer than was previously believed. However, the Deloitte & Touche survey also finds that one-third of information executives who left their jobs did so unwillingly. In our story, headhunters and ex-CIOs offer some perspective on this phenomenon, noting that changing jobs isn't necessarily a bad idea for executives. Such partings don't always come about because the executive put in a poor performance.

Although business units often call the shots for IS, information executives are adding value and increasingly heading up efforts to link business units and create the corporate information infrastructure. This appears to be paying off. Proponents of the productivity paradox—which says that investments in IT don't produce adequate returns for organizations—are now softening their views.

One of those critics is Stephen S. Roach, principal and senior economist with Morgan Stanley & Co. An IT naysayer, Roach now notes that IT is being used at more-strategic levels in the organization and can be more-readily translated to bottom-line results. (Please see "A Resounding Maybe," by Senior Writer Carol Hildebrand, beginning on Page 34.)

And MIT's Sloan School of Management, the outpost of productivity-paradox guru Lester Thurow, recently reversed its position, citing results of a recent study. The study, which examined IT investment at 367 large firms, concluded that the gross return on investment from computer capital averaged between 58 and 81 percent for manufacturing and services between 1987 and 1991. The MIT group states, "The productivity paradox disappeared by 1991. . . ."

This is certainly good news for IT executives who have been hard put to deliver this bottom-line message.

Marcia Blumenthal

CIO

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Contributing Writers Nora Sherwood Bryan, Sharon L. Caudle, James A. Champy, Stephen Mills, Mickey Williamson

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LETTER FROM THE PUBLISHER

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> *"Basically, the days are gone when you could embark on general IT-acquisition programs. Instead, IT needs to be directly tied to measurable payoffs."*
>
> *—Stephen Roach*
> *Principal and senior economist*
> *Morgan Stanley & Co.*

The naysayers have been proven wrong. Productivity is on the rise in business. Corporate rightsizing and the management of IT investments have undoubtedly contributed greatly to this upswing.

Economist Stephen Roach once dismissed technology's ability to improve productivity in the service sector. He now concedes that productivity gains from technology are being achieved, as companies successfully reengineer work processes to correct the hiring and buying indulgences of the '80s. (See "A Resounding Maybe," Page 34.) But it took a combination of outside forces, including increased foreign competition, deregulation and a recession, to jolt the service industry out of its complacency. The final wake-up call came when people began casting doubt on the assumption that computers would increase productivity. Organizations knew it was time to reexamine the process, and managing the IT infrastructure became the critical success factor for many service companies.

It's important that technology suppliers understand this emerging corporate strategy and, in response, offer more than just a product. As companies look to justify their investments and evaluate bottom-line benefits, vendors must demonstrate the business value of technology products and services. Heads of organizations will no longer sit idly by while single departments make purchasing decisions that offset profits. A well-planned corporate strategy will dictate IT acquisitions; the vendor that fails to recognize this will lose sales to those that embrace and support a company's vision and bottom line.

Coming In CIO

SPECIAL SOFTWARE ISSUE:
What Price Client/Server?

The Manager As Coach

As more organizations move to client/server, IS managers are seeing their roles shift from administrator to "coach." Status is no longer a matter of how many direct reports you have; rather, you earn your laurels by instilling experience in others, leading successful teams and influencing the organization.

Questions of Cost

CIOs have always recognized that client/server systems are complex and riddled with hidden costs. In addition, the environments in which they are implemented vary so much that making generalizations is tough. So while the pool of information about client/server costs has grown in the last two years, calculating the economics for your own company can seem like a black art.

Whither Client/Server?

Like their customers, software vendors are forced to make predictions about the future of client/server and stake their own futures on them. *CIO* asks four vendor CEOs for their views on upcoming trends.

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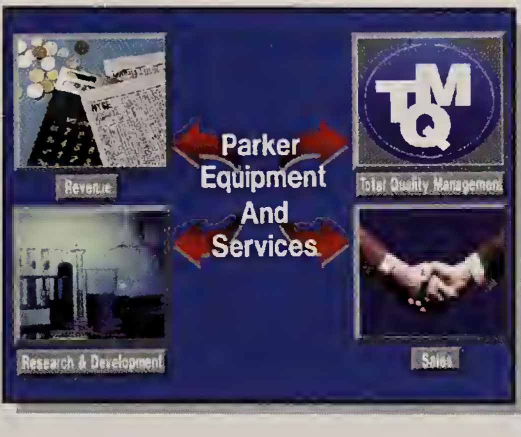

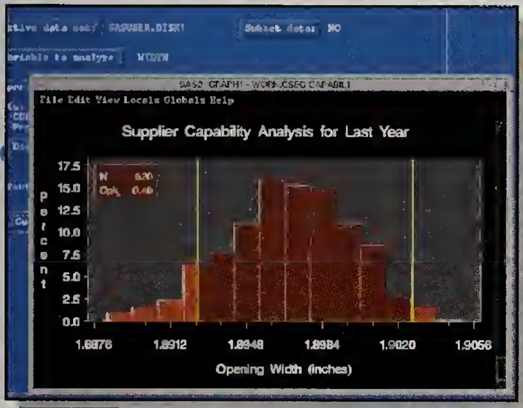

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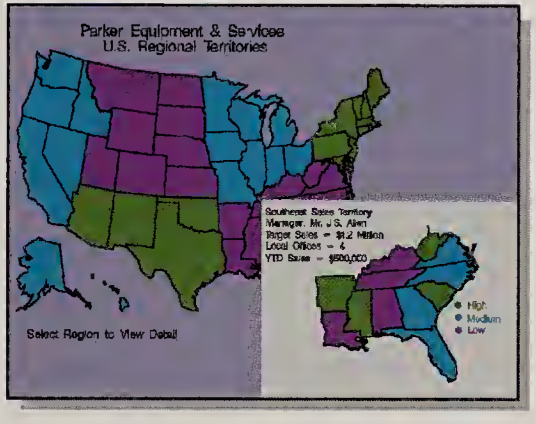
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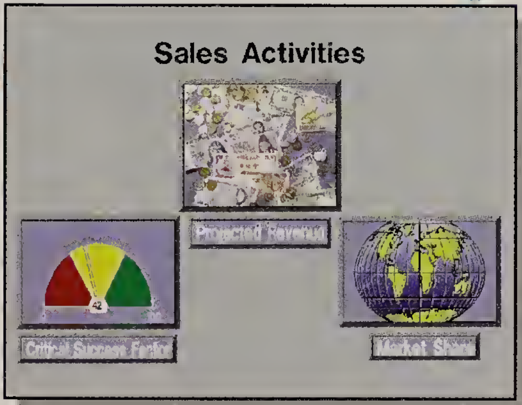

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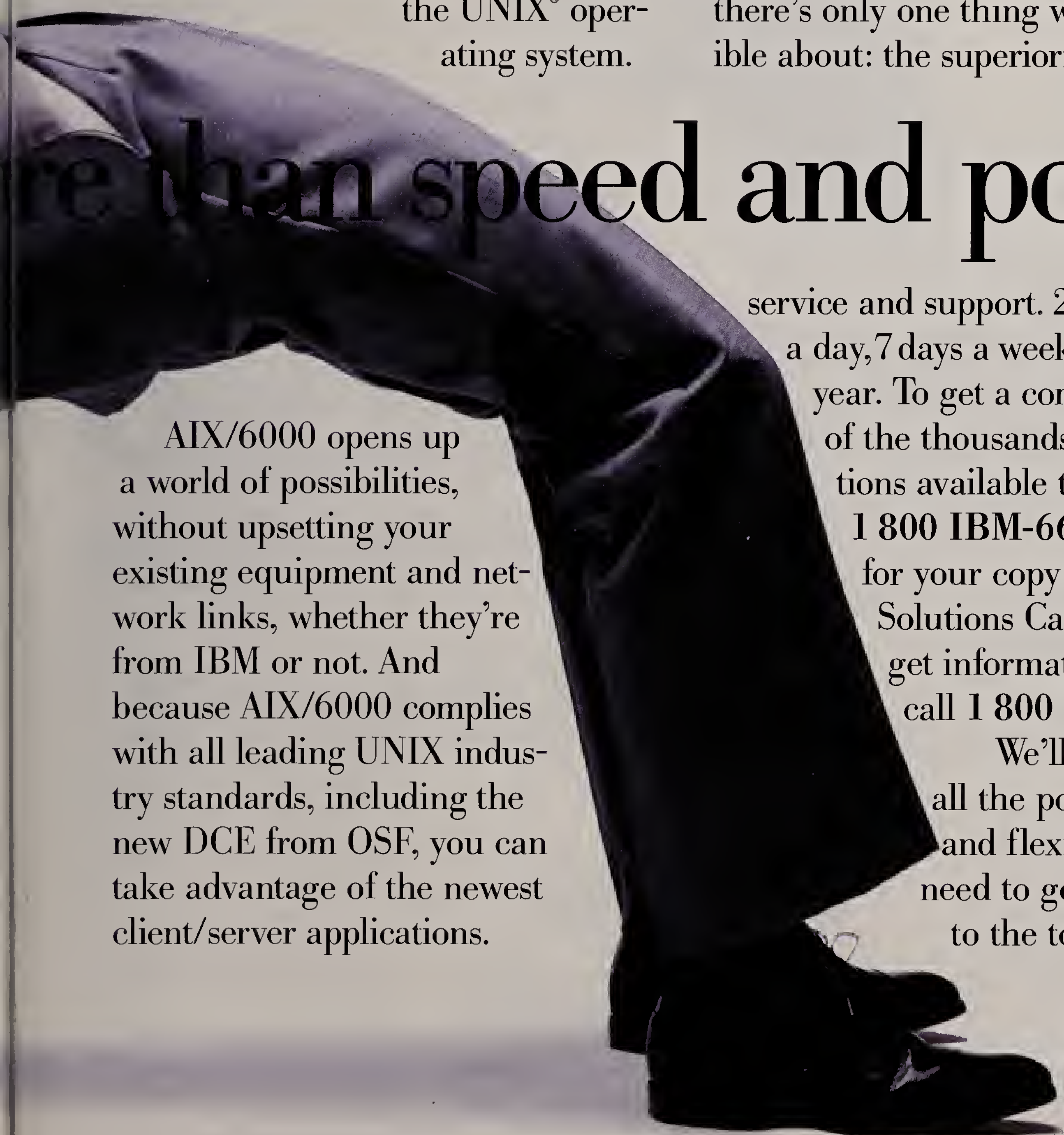

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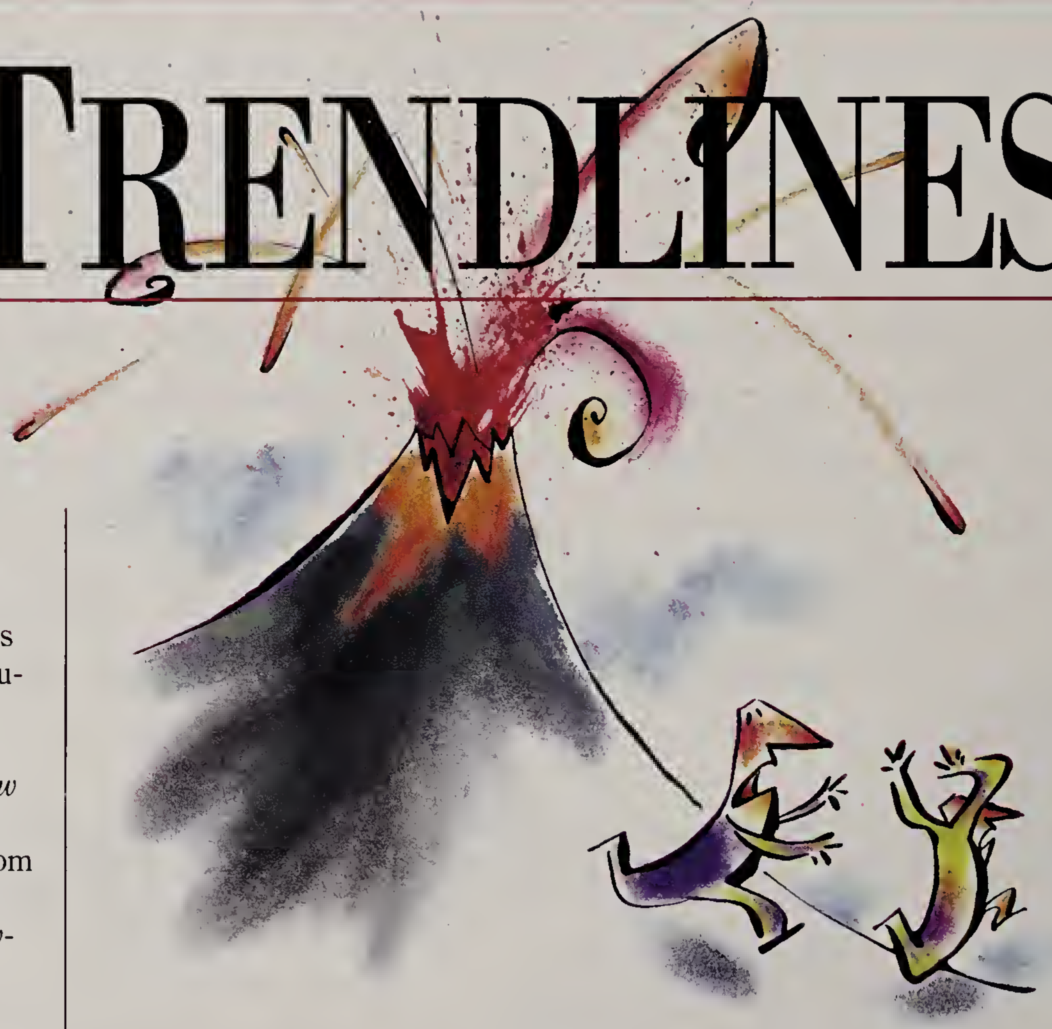

WHEN WORST COMES TO WORST

These are nervous times we live in, but IS executives will sleep better with the second edition of the *Disaster Recovery Yellow Pages* resting by their bedside phones. The guide, from The Systems Audit Group Inc. and *The Disaster Recovery Journal,* lists recovery services throughout the United States and takes into account every awful thing that can happen to your IT organization short of a plague of locusts.

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I lift my lamp beside the golden door!

BAR CODE

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I lift my lamp beside the golden door!

LATE FEES

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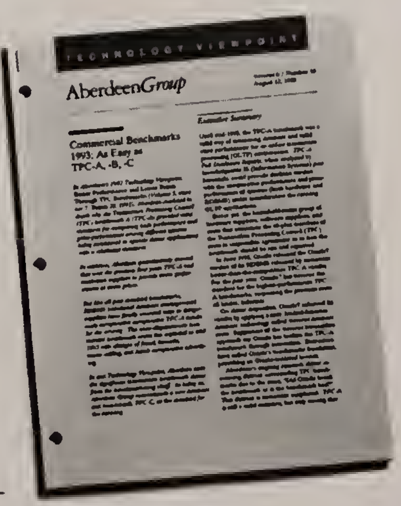

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Commercial Benchmarks 1993: As Easy as TPC-A, -B, -C

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- complex database
- contention on data access and update

Hardware vendors that have used INFORMIX-OnLine to publish TPC-C benchmarks include: Hewlett-Packard, IBM, ICL and NCR.

*UNIX TPC-audited benchmarks published by hardware manufacturers as of 11/1/93.

12	0	0
Informix	**Oracle**	**Sybase**

Source: Transaction Processing Performance Council (TPC), 1993.

INFORMIX-OnLine. Real-World Database Performance.

"TPC-C benchmark's key advantage is a very close emulation of actual user workloads. It has the complexity that real OLTP programs exhibit. Our test results show Informix to be an excellent vehicle for developing high-performance transaction processing applications."
—**Hewlett-Packard**

"TPC-C provides the industry with a significant new complex, strenuous OLTP benchmark for measuring computer system performance in a business environment."
—**Transaction Processing Performance Council**

"...the TPC-C benchmark accurately resembles hundreds of customer applications Aberdeen has observed over the years. For that reason, Aberdeen believes TPC-C is the best-yet benchmark technology for predicting real-world application performance of total systems in most real-world IS production environments..."
—**The Aberdeen Group, August 12, 1993**

When the Transaction Processing Performance Council designed the new TPC-C benchmarks, they had a real-world performance test in mind. Unlike earlier, simpler TPC benchmarks, TPC-C mirrors transaction-intensive business applications that run a company's day-to-day operations—like yours.

Hardware Vendors Choose INFORMIX-OnLine.

This kind of complex, real-world benchmark requires a high-performance relational database. Which is why hardware vendors running TPC-C are using INFORMIX-OnLine. And of all the leading independent relational database servers only INFORMIX-OnLine is being used by hardware vendors to publish TPC-C results. Not Oracle. Not Sybase.

Why INFORMIX-OnLine?

INFORMIX-OnLine is engineered for real-world performance. It's fully scalable—from relatively small size systems to systems running the largest (over 100 gigabytes) UNIX databases in the world. And it incorporates standards-based technology to provide triggers, two-phase commit, data and referential integrity, backup and recovery, TP/XA support and a host of other features essential for developing and deploying applications throughout a company's operations.

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If you're unsure about what benchmark numbers are telling you, take a look at the Transaction Processing Performance Council's TPC-C specification. And then take a look at INFORMIX-OnLine. Because in the only independent benchmark designed to show representative, real-world results, INFORMIX-OnLine is the database of choice.

Free Aberdeen Group Report.

Find out more about TPC benchmarking and Informix in the new Aberdeen Group Report, "Commercial Benchmarks 1993: As Easy as TPC-A, -B, -C." **Call us at 1·800·688·IFMX, ext. 12 or send in the reply card and we'll send the report to you—free of charge.**

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voices to a PC once a week, then generate a payment list and exception report that details late deliveries. This report is attached to a form letter requesting a refund and forwarded to FedEx. The process takes less than 10 minutes each week, according to the company.

TCS President Lester Probst admits that FedEx has "an almost-perfect delivery record." But he says that users of the software have reported that "an average of 2 percent of their total FedEx charges are recouped because of late deliveries." Call 908 548-1200.

HOLLYWOOD SETS ITS SITES

Scouting movie locations isn't easy. Sure the makers of *Cliffhanger* wanted a mountain—but which mountain? And Martin Scorsese wouldn't have been satisfied with just any old opera house for the opening scene of *The Age of Innocence.*

Currently, movie producers looking for a specific type of site must contact state film commissions and request photographs. That can be time-consuming—and time isn't something that moviemakers on tight schedules can afford to spare. A new product from Eastman Kodak Co. called Eastman Exchange provides a database of digitized still photographs of film sites compiled by these commissions.

A limited version of the application featuring images from New York and Arkansas is being piloted at Disney, Universal, Warner Brothers and Twentieth Century Fox studios. The pilot will soon be expanded to include 10 to 20 more states. Kodak hopes that when Eastman Exchange is rolled out later this year, it will include sites from all 50 states and a number of international locations, as well as images of props and talent.

Using standard telecommunications networks and computing platforms, the product gives producers immediate access to images ranging from stunning mountain vistas to quaint villages to dramatic cityscapes. Location scouts call up pictures using simple words and phrases, such as "castle" and "ocean." More-detailed searches can also be conducted using more than 40 image descriptors.

Eastman Exchange is an offshoot of the recently released Kodak Picture Exchange, which gives photo-stock users online access to images.

For information call 716 724-6404.

LAST CALL FOR PAPERS

The Society for Information Management (SIM) is seeking papers for its 1994 International Paper Awards Competition, which recognizes exceptional achievements in IS management and services. Qualified papers describe an original or strategic information system or service, new approaches to development and implementation, or useful techniques for managing IS activities; the subject described must be implemented at an organization and must have made a significant impact. The first-place paper will be published in *MIS Quarterly*.

Interested authors must submit an abstract no longer than 1,000 words by Feb. 12 to Ken Kozar, associate professor, University of Colorado at Boulder, College of Business, Campus Box 419, Boulder, Colo. 80309-0419; the phone number is 303 492-8347, and the fax number is 303 492-5962. Competition guidelines are available from SIM at 312 644-6610.

SOFTWARE DEVELOPMENT

A HARD LOOK IN THE MIRROR

Conversion is the name of the game in many defense-related firms these days—and one of the fruits of conversion may help CIOs deliver new systems more effectively. The SEI Capability Maturity Model, originally developed for Department of Defense projects (and the avionics industry) by the Software Engineering Institute at Carnegie Mellon University, is a software self-assessment tool that is growing in popularity among companies familiar with it.

Briefly, deploying the SEI model is an experience similar to applying for the Malcolm Baldrige Award. IS departments match their own work practices against the SEI evaluation criteria—a matrix of good, better and best practices for software development. IS managers can rank their shops' own ef-

ILLUSTRATION BY JAMIE HOGAN

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forts against the model for a sense of where their strengths and weaknesses lie.

CIOs say the SEI model is relatively simple to implement and provides a variety of benefits. For instance, they can use the model to gain insights into how to improve processes for managing productivity and quality. Also, it nudges IS executives—indeed, the IS staff as a whole—to look beyond individual projects and consider the overall process being deployed in software development. Rick Swanborg, principal at Ernst & Young's Boston-based Center for Information Technology and Strategy, says that one CIO found the assessment survey a useful mechanism for getting programmers to realize they had a quality problem. "It was a humbling experience for the staff," Swanborg quotes the CIO as saying.

Among IS executives surveyed about quality practices for last year's Benchmarking Project (a joint research effort of the Society for Information Management and the Center for Information Technology and Strategy), those who had adopted the SEI model were keen on it. Swanborg sees this as an indication that these executives are taking a broader view of systems delivery—and placing more emphasis on measuring IT effectiveness in the business. According to Swanborg, managers who once flocked to the latest and greatest development tool, hoping for instant improvement in projects at hand, may be coming to terms with the fact that all their practices must be integrated into their unique environments and into a rational, effective process. In other words, perhaps the cure for the "magic bullet" syndrome begins with a holistic diagnosis. ■

West Side Storage

ILLUSTRATION BY JAMIE HOGAN

The link between music and computers was suggested in 1968 when a dying HAL sang "Daisy" in the movie *2001*. Since then the connection has become more explicit, as evidenced by the Library of Congress's initiative to develop an electronic archive of musical materials.

Leonard Bernstein is the subject of the library's first efforts. The composer/conductor's personal and professional archives—including 200 hours of film and video programs, 1,000 hours of recorded sounds, unpublished compositions, lecture manuscripts, business records, photographs and correspondence—were donated to the library by Bernstein's estate late last year. The library is using the materials to produce the core of the new archives, linking it, over time, with multimedia collections around the world.

The project's goals are to preserve the Bernstein archive as a physical collection, ensure its future distribution to a wide audience by creating a digital-access version, select tools and procedures for processing, store and distribute information from the archive, and expand the scope of the collection beyond the traditional music community.

"My father would be...particularly excited by the educational possibilities that digital formatting will bring to this material," said Nina Bernstein, the musician's daughter, when the project was announced. "We offer the Leonard Bernstein archives as a catalyst for developing other digital archives across the globe." ■

Learning Statesmanship

With innovative applications of smart cards and kiosks, state governments are demonstrating that he who governs best governs electronically. But Washington had better tread carefully as it follows the states' lead, or the potential benefits of electronic services may be lost, according to a recent report from the Office of Technology Assessment (OTA).

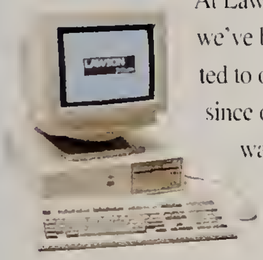
Although electronic delivery of services could potentially save money for federal agencies, there is no guarantee. Instead, says the OTA, the biggest payoff may come from the restructuring and streamlining of government programs enabled by IT, and from the application of technology to improving social, economic, educational and health conditions.

The OTA believes that the greatest risks of electronic delivery lie in overlooking the need for accessible, user-friendly applications; widening the gap between educated, technologically proficient citizens and disadvantaged segments of the population; and failing to capitalize on the opportunities for innovation and economies of scale made possible by partnerships among federal, state and local governments, and istribution Management System • Lawson Materials Management System •

HOW TO UNRAVEL THE CLIENT/SERVER MYSTIQUE.

First, accept that there is no mystique. Rather, there are hordes of slightly frantic software companies content to have you believe that effective open system solutions remain elusive while they rush to understand, develop, and market their interpretation of client/server. Then there's Lawson Software.

An Open Systems Foundation



At Lawson Software, we've been committed to open systems since our company was founded in 1975. We've always believed that to be a valuable business partner, an applications provider must offer choices for business strategy development. So for us, client/server isn't a new phenomenon. Instead, it's the next logical step in our development. And it exists today – fully developed and fully functional – in the latest release of our enterprise-wide, cross-industry, world-class business application software.

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The truth is, client/server takes on a special meaning for each individual business computing environment. That's why we've structured our client/server solution as a comprehensive 3-tier architecture, delivering you maximum flexibility in hardware, database and user interface. It's why Lawson's products run across platforms like the AS/400 as well as UNIX systems such as the RS/6000 and HP9000. And it's also why we feature seamless support for a variety of leading databases. In short, we offer options that allow you to make the decisions. Based on your existing hardware configurations and your plans for future development, you choose to place the components of client/server where they will deliver the greatest value and performance.

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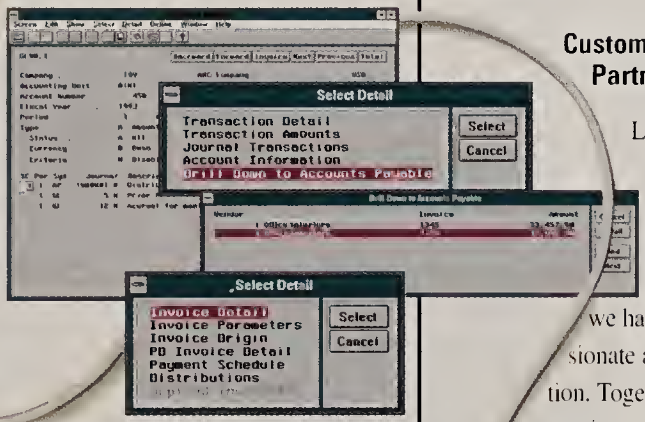

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Lawson Software has always been focused on leading edge technology. And we have always been passionate about client satisfaction. Together, these two commitments have resulted in truly flexible business solutions created with your needs in mind. We'd like the chance to demonstrate this to you. You'll see how – from our system architecture to our award winning client services – Lawson Software really does unravel the client/server mystique.

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TRENDLINES

between the public and private sectors.

If electronic delivery is to succeed, the OTA concludes, the federal government must redesign its outdated management structure for IT applications and establish statutes on privacy, security, procurement, open government, freedom of information, and records management and archiving. The agency also suggests revising the concept of universal telephone service to include advanced telecommunications and computer networking.

KEEPING IT CLEAN

In a Trendlines section last November, we reported on the growing prevalence of electronic sexual harassment in the workplace. Now, a computer-based training program is giving organizations an electronic means of battling this problem.

An updated version of Avoiding Sexual Harassment, a product of Guided Learning Systems Inc. in Lebanon, N.J., shipped one week after the U.S. Supreme Court handed down its unanimous decision in Harris vs. Forklift Systems. The justices determined that crude sexual remarks and innuendoes create a "hostile working environment" that employees don't have to tolerate. The new, interactive program makes clear what constitutes such a hostile environment by guiding employees through case studies and incidents, concentrating on actions and remarks that are somewhat ambiguous. The program offers guidelines and suggestions as well as a model policy on harassment.

Perhaps the program's chief selling point is that because it is computer-based, it "defuses some of the embarrassment" of the subject, says Dorothy Bertany, administrator for Hunterdon County, N.J., a test site for the product.

EVENTS

MarkeTechnics '94
Tampa Convention Center,
Tampa, Fla.
Feb. 27-March 1
Food Marketing Institute
202 452-8444

This conference explores the integration of technology with merchandising and operations in the supermarket of the '90s. Composed of three days of educational sessions, MarkeTechnics includes a track on electronic-payment systems and offers 150 exhibits. Registration: $300-$550

GroupWare '94
The John B. Hynes Convention Center, Boston
Feb. 27-March 2
The Conference Group
602 661-1260

GroupWare '94 focuses on the commercial aspects of groupware and workgroup technology. The conference features more than 40 sessions and 100 vendors that will demonstrate the latest in E-mail, shared memory, databases and other groupware solutions. Registration: $295-$995

Intermedia '94
San Jose Convention Center,
San Jose, Calif.
March 1-3
Reed Exhibition Companies
212 527-8930

This trade show focuses on multimedia technologies. It features general sessions and in-depth panel discussions focusing on industry developments, consumers and education, corporations and government, and distribution through the media and marketing. There is no registration fee.

Mobile '94
San Jose Convention Center,
San Jose, Calif.
March 7-9
Technologic Partners
212 696-9330

Mobile '94 examines portable computing and communications systems that address strategic business issues. It includes sessions on wireless data, remote network access, personal digital assistants, information services and mobile computers. Registration: $995

WHERE THE BUCKS ARE

There's gold in them thar hills for leading-edge-technology experts, according to National Computer Associates (NCA), a coast-to-coast network of information systems recruitment and placement firms. A recent NCA study suggests that this year, major computer-reliant corporations will offer IS professionals salaries significantly above 1993 levels.

The survey of 1,900 companies shows salaries for emerging-technology specialists averaging 8 percent—and peaking as high as 14 percent—above last year's levels. The greatest activity in hiring and boosting salaries will occur in banking, brokerage and financial-services firms, the organization says.

Leading the salary escalation will be LAN/WAN networking managers and telecommunications specialists, whose pay will rise by 9 to 14 percent above last year's levels, the survey shows. Close behind will be client/server developers and programmer/analysts (8 to 13 percent) and C/Unix/Windows developers, including specialists in graphical user interfaces and object technology (8 to 11 percent).

For more information on the study and its findings, call 612 337-3000.

PHOTO BY DAVID BISHOP/PHOTOTAKE

RemoteWare, and the CONVERSION OF JARED FARRELL.

A skeptic FROM WAY BACK, Jared Farrell the Salesman had outlived more than one attempt at automating field communications. The near-daily software updates. Nightly communication sessions that didn't. Inventory that wasn't. Prospects that...weren't.

So the fact that something called RemoteWare® had been implemented to automate sales processes for farflung laptop jockeys like himself had held little charm for Farrell. A client/server system built with software tools already happily in use in hundreds of large companies worldwide, with automated dial-up communications for transporting centrally-created electronic forms, documents and reports between home office legacy systems and even the most remote PCs? Terrific. Plus routing and query facilities to make sales-critical information simple to get and easy to use... on the road. Excuse me?

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But within just days of the fading hook shot that sent the CIO's announcement memo into Farrell's round file, he was using the new applications electronically dispensed by RemoteWare. Entering daily orders, filing expenses, and penning a humble note of thanks to the CIO, from 30,000 feet. All quietly and automatically delivered by RemoteWare while he slept. A fitting complement to the inimitable selling routine of one Jared Farrell. Indeed.

Now, as he slid into the Central Office Staff Room six months later and five minutes late, Farrell watched the eyes of the room swivel towards him, like half a volley at Wimbledon. And the CIO and VP of Sales were headed his way with...a plaque? "Jared Farrell, Salesperson of the Year," it read. Salesperson of the Year. Imagine that.

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An Ambitious Agenda

Reengineering, client/server and squeezing the budget top CIOs' plans for 1994

BY JAMES A. CHAMPY

The challenge of running IS in a big corporation—a formidable job ever since the first "glass houses" were built some 40 years ago—is greater than ever. The reengineering phenomenon shows no sign of abating, presenting IS executives with both unprecedented opportunities and new demands; the downsizing of systems from mainframe to client/server technology is accelerating, requiring a rethinking and restructuring of IS responsibilities; and the days of easy IS-budget growth are a distant memory, forcing CIOs and the business units they support to make some hard choices.

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Those are some conclusions from the seventh annual CSC Index Inc. survey on the state of IS management, *Critical Issues of I/S Management for 1994*. Last September, CSC Index polled 556 IS executives in North American companies with annual sales of at least $250 million (the majority had more than $1 billion). Some 88 percent of the respondents were the most-senior IS executives in their corporations, subsidiaries or divisions. They listed their most-pressing management issues, identified the business functions in their organizations that would receive heavy technology investments in the coming year, indicated whether their budgets were growing, shrinking or staying the same, and described their companies' rate of adoption of nearly 40 critical technologies.

From reams of survey data, three major trends emerged:

- The reengineering phenomenon is real, requiring IS to understand the organization's strategies and processes intimately and to quickly build applications across functional boundaries for redesigned business processes. For the fourth time in five years, "reengineering business processes through information technology" was the highest-ranked issue in the IS-executive community. This is hardly a surprise, given the tremendous amount of press coverage on reengineering in 1993. Nearly two-thirds (63 percent) of the respondents said their companies had active reengineering projects. Of those, 70 percent said the IS organization was part of the reengineering team and 54 percent said IS was developing systems for reengineered processes. Only 2 percent said IS was not involved in the reengineering project.

CSC Index views the high ranking of certain other issues as evidence that IS executives want to play in the reengineering game. These issues include aligning the goals of IS with those of the corporation (the No. 2 management issue for 1994), building systems across functional boundaries (tied for fourth) and improving the systems-building process itself (sixth). Aligning IS with the business has finished first or second in all but one of CSC Index's annual surveys; in order for business executives to trust IS personnel to help them redesign critical business processes, the goals of IS must be in sync with those of the business. Reengineering results in new processes that cross the boundaries of sales, marketing, finance and other functions. The computer sys-

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Top 10 IS Management Issues for 1994*

	1994+	1993	1992	1991	1990
Reengineering Business Processes	1	1	2	1	1
Aligning IS and Corporate Goals	2	2	1	2	4
Organizing/Utilizing Data	3	4	4	5	7
Instituting Cross-Functional Systems	4	4	6	3	3
Creating an Information Architecture	4	7	3	8	9
Improving the Systems-Development Process	6	3	9	4	6
Updating Obsolete Systems	7	8	18	■	13
Improving the IS Human Resource	8	12	5	13	11
Integrating Systems	8	11	13	9	16
Changing Technology Platforms	8	10	■	■	■

* SURVEY OF 556 NORTH AMERICAN SENIOR I.S. EXECUTIVES
+ BECAUSE OF THE TIES FOR 4TH AND 8TH PLACE THIS YEAR, RANKS SHOWN DO NOT NUMBER ONE THROUGH TEN
■ NOT RANKED THAT YEAR
SOURCE: CSC INDEX INC., CAMBRIDGE, MASS.

tems underlying these reengineered processes must also cross functional boundaries. And to meet top management's increasing demand for quick results from reengineering, IS must learn new "fast-cycle" development approaches, the No. 6 issue. Nearly half (48 percent) of respondents were piloting, implementing or using rapid-application-development tools. The big question here is whether these IS organizations can "reengineer" themselves to meet the challenge of reengineering the business.

- Companies appear to be shifting quickly from the corporate mainframe to far-flung client/server networks. "Changing technology platforms"—defined as downsizing computer applications from mainframes to client/server architectures and/or PCs—rose a couple of notches to No. 8 this year, up from No. 10 a year ago. Nearly half (45 percent) of the surveyed organizations were using client/server technology, 20 percent were implementing it, 16 percent were piloting its usage and 16 percent were researching the technology. Only 2 percent had no activity at all with client/server. And client/server was by far the technology set of greatest interest.
- Companies are getting even tighter with their IT spending and restricting investments to the areas of their businesses that touch the customer. IS budgets will rise an anemic 2.3 percent in 1994, down from a 2.5 percent gain a year ago, marking the smallest rise since the survey was launched. Some 51 percent of the respondents said their budgets would grow in '94, 20 percent said they would decline and 29 percent said they would stay the same. A year ago, the corresponding numbers were 54 percent, 21 percent and 25 percent.

When asked where they would make significant technology investments in '94, by far the most-frequently cited business area was customer service (chosen by 72 percent). Another area that directly affects customers—order processing—was next (59 percent). Areas not directly connected to improving customer service, such as purchasing (30 percent), internal training (19 percent) and marketing (28 percent), were far down the technology-investment wish list.

Seventy-two percent of respondents said they would make significant technology investments in customer service.

For IS executives, these trends are gale-force winds—powerful forces that CIOs must deal with and that will redefine the way companies organize, manage and use their computing resources. They are the result of business executives' desire to creatively apply information technology to reengineer the business; the advent of new technologies in smaller, cheaper packages that provide greater functionality and ease of use than the inflexible mainframes of yesteryear; and an urgent need to cut all corporate costs (including the technology budget), which is fueling the prevalence of outsourcing arrangements.

These times demand a lot from CIOs. They must help executives redesign core business processes for dramatic improvements in time, cost and quality. They must reconfigure the "business of IS" so that systems are built and maintained quickly. And they must help their organizations monitor technology developments and adopt promising advancements to get a leg up in their markets.

When companies decide to reengineer, it's because business as usual was killing them. In these times, "IS as usual" has become hazardous to the health of CIOs and their IS organizations. There's never been a greater opportunity—or greater risk—for IS to help the company capitalize on the enormous potential of information technology.

James A. Champy is president of CSC Consulting Group, a Cambridge, Mass., unit of Computer Sciences Corp. He is co-author of Reengineering the Corporation: A Manifesto for Business Revolution.

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Elected Reforms

Government departments and agencies struggling to reinvent themselves must learn how to manage their information resources more effectively

BY SHARON L. CAUDLE

Well-crafted information management (IM) efforts frequently make the difference between poor and effective organizational performance. But knowing what goals to set, what strategies to implement (and how), and how to measure performance is often a hit-or-miss proposition.

In an effort to help government departments and agencies strengthen their IM capabilities, the U.S. General Accounting Office recently completed a study of strategic IM practices in 19 private, state and federal organizations. Additional data was gathered from focus groups of senior government program and IS managers.

There are five fundamental practices important to these organizations' success in managing their information resources.

1 **Senior managers** view strategic IM decisions and implementation as critical for effective organizational performance and service delivery.

In the most-successful case-study organizations, senior managers provide the leadership for a strong IM approach rather than delegate decision-making or accountability to mid- and lower-level managers and staff. They set high expectations for change and facilitate it through a defined change-management program.

These managers ferret out organizational performance problems that need correcting and understand how important IM is to solving those problems. In government, people are normally so tied into rules and procedures that only visible situations of some magnitude will produce real movement. These managers use "windows of opportunity," such as budget crises or project failures, to motivate change.

Other tactics include setting up top-management councils to make and monitor strategic decisions and supporting "champions" to carry out the details of implementation. One state agency set up an information-leadership council led by business managers. This group is responsible for establishing a direction for information resources; publicizing the agency's IM vision, mission, goals and priorities; promoting standards, guidelines and a framework for information integration and integrity; and encouraging accountability for information management.

Managers at the most-successful organizations stay in touch with these councils and champions and use other tools to evaluate progress and decide on further actions needed. And there are no "sacred cows"; all structures, systems, staff, policies and procedures are subject to change.

2 **Specific, customer-focused business goals** drive IM plans. The primary emphasis is on business-process analysis and reengineering.

In the leading organizations, customer involvement goes well be-

ILLUSTRATION BY MARK FISHER

yond asking users what they want and then building it. Such concepts as customer alignment, user control and customer empowerment are put into action, and the business managers who serve end customers are the ultimate decision-makers. IM professionals act as investment counselors regarding information-resource trends and applications. As a result, IM strategy, resource allocations and performance-evaluation decisions are not divorced from mission and program goals.

Principles—also called value statements—guide IM decision-making. They cover topics such as general management, communications, architecture and applications. (An example would be, "Information systems will be integrated and utilize consolidated databases.") One private company crafted its principles by asking internal customers what the information management group should not do and then reversing the suggestions. Such principles ensure consistency in a distributed environment of many platforms, users and decision-makers.

One state organization refers to its principles when beginning new projects or working on standards or a statewide architecture. At another, principles helped bridge the communication gap between program and information managers by defining and distinguishing between concepts like decentralized and distributed.

The most-successful organizations surveyed emphasize business-process analysis and reengineering. Business processes are identified and analyzed at a high level. In one state, core business processes are defined in terms of "data communities" rather than single functions and applications. (Data communities are found where business processes cross organizational and functional boundaries.)

Reengineering projects at these organizations are driven by business goals and include cross-functional efforts and extension into customers' and suppliers' business processes. Creating prototypes and conducting pilot projects minimizes risk and demonstrates the real benefits of doing business differently. Reengineering work is supported by appropriate architectural standards consistent with business goals. The architecture is described in detail, so all relationships are distinct and understandable for line managers and IM professionals.

> **Once IM projects are funded, top-level managers continue their supervision. They require rigorous formal tracking and reporting of each project's design, implementation, maintenance costs and contribution to mission goals and service delivery.**

Finally, reengineering projects at the most-successful organizations must result in substantial improvements: for example, 80 percent reduction in customer cycle time, 50 percent in overhead and 60 percent in personnel needs.

3 Decisions regarding the selection, funding and ongoing support of IM projects are made by top management using business-driven criteria.

Senior managers, typically sitting on an investment-review board, use formal, well-understood criteria to select and fund IM projects. These criteria assess alignment with the organization's strategic objectives, benefits to external and internal customers, developmental and maintenance costs, and organizational impact and risks. The criteria can be weighted according to their importance, and they are strictly applied to all project proposals. Decision-support tools such as checklists of specified criteria are necessary to present consistent and comparable information.

The investment process questions enhancements to aging systems and favors moving scarce resources to new, more-vital, business-goal applications. For example, one organization categorizes projects as those vital to organizational success, those important for separate functions and all others. Over time, progressive investment decisions move available funding to the vital projects.

Once IM projects are funded, top-level managers continue their supervision. They require rigorous formal tracking and reporting of each project's design, implementation, maintenance costs and contribution to mission goals and service delivery. Senior line managers are held accountable for project delivery and progress reporting.

4 Business goals and strategies have well-defined performance measures; there are complementary measures for information management.

Performance management is made visible in the organization through senior-management attention. Expectations are embedded in the overall strategic-management process, from planning to evaluation of outcomes. Performance measures—which are derived from and attached to each mission-delivery strategy—include service-level achievements, error rates and timeliness standards; these are defined for each important customer/user of information services. The performance measures test the actual delivery of customer-defined services and whether they meet acceptable cost, quality, quantity and time requirements. Internal and external benchmarks are used as constant reference points.

5 Top-level managers build and support a central IM group that can respond to business goals and strategies.

Lastly, the IM group is carefully designed and managed—structured to support existing and planned busi-

REFORM ROADBLOCKS

There are several barriers to adopting the five information management fundamentals in a government setting:

- **Top management has no long-term interest in or understanding of IM.** Traditionally, senior government managers have had limited terms in office—20 months in the federal government, for example. These managers devote their energies to developing policies, not to determining how they will be implemented. Information management (IM) itself has not been identified within the organization as critical to implementing policy and achieving quality, productivity and cost-reduction gains.

  The federal government lacks training, guidelines, mandates and other ways to promote top-management understanding of IM issues. The roles and responsibilities of program line managers who might bring together policy issues and management responses have been poorly defined.

- **A lack of overall business planning hinders the creation and funding of strategic IM plans and projects.** Available funding has generally been allocated to maintain existing, aging information systems rather than to develop new, more-effective systems. Or IM funding has been considered discretionary—held in escrow to fix shortfalls in other areas of agency spending, according to one federal manager. A state official noted that political support frequently dries up before a project is done. Another noted that managers have to deal with too much paperwork and strict legislative timeframes that do not fit internal government approval and procurement processes.

- **The power of existing IM groups depends largely on the number of people, machines and complex systems they have.** New incentives are needed for saving money and developing new ways of using information technology. IM-group managers and staff members—many of them from technical disciplines—have difficulty communicating technology solutions in business terms. With limited training and hiring opportunities, the group cannot develop the sophisticated technical skills to either provide direct services or supervise contractors who do.

- **Federal-oversight leadership and incentives do not support longer-term, strategic information management.** Central-management agencies such as the Office of Management and Budget and the General Services Administration have not emphasized or provided a vision for strategic actions on the part of departments and agencies. They have focused on individual projects, their funding and the procurement of technology. Meanwhile, overall business goals, business-process reengineering and performance measures have received short shrift in oversight reviews and approvals. The focus, according to one state legislator, should be to link systems-development program goals with outcome-based measures and to push the state central-oversight groups to be stronger in information management. *–S. Caudle*

ness goals and strategies. The group consolidates most IM functions, from technology services to data and records management. It is placed under a senior manager—a CIO—who is part of the top-management team. The manager and group are expected to provide overall IM leadership and support as directed by top management. This includes setting organizationwide policy, ensuring adherence to technical standards and architectures, providing consulting and new-technology assessment, participating in business-process reengineering teams and providing day-to-day operational IT support.

At the most-successful organizations, the roles and responsibilities of the central IM group, line managers and staff in carrying out IM goals are clearly defined. The central group generally develops a business plan to reflect what line managers want. Career development for IM-group staff includes both technical and managerial skills.

One strategy that IM groups have used to build stronger partnerships with their customers is simply stepping back and assessing their current projects and how they work. For example, one group had been under fire for its poor relationships with customers. The group had inherited a legacy of specialization, meaning that customers had to talk to a lot of different IM professionals on systems-development projects. To correct this problem, the group began to build a new organization that would provide team-based centers of expertise responsive to individual customers.

In one state agency, the CIO worked with his senior program managers to develop their own strategic business plans and support IM initiatives. In another agency, the CIO went to the top executive and complained that the agency did not have any real business strategy, just undocumented beliefs and vision. He built a model, business unit by business unit, of the employees, the technology used, the business functions and the budget involved. This enterprise model became the foundation for later key business and IM decisions.

Sharon L. Caudle is a project director at the National Academy of Public Administration in Washington. This article does not reflect the official views or position of the U.S. General Accounting Office.

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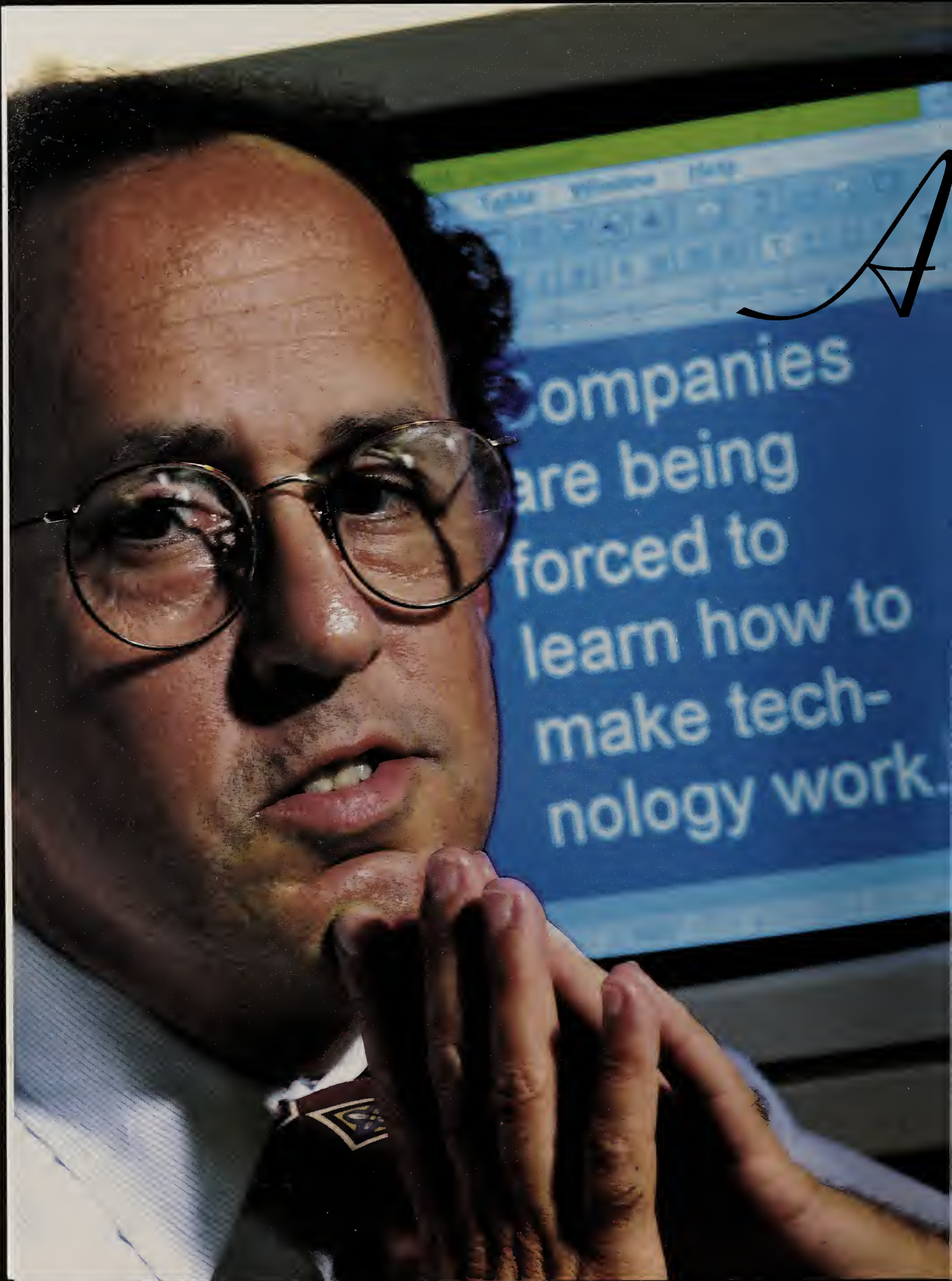


A

Companies are being forced to learn how to make technology work...

Resounding MAYBE

BY CAROL HILDEBRAND

In recent months, there's been renewed debate over the so-called productivity paradox. It seems investments in IT are paying off after all. Economist Stephen Roach, a leading critic of IT investment in the service sector, explains where service companies ran amok in the past and how that is changing.

HAS THE SERVICE SECTOR'S CHIEF PROFESsional hand-wringer finally been silenced? Not entirely, but after years of blaming service companies' stagnant productivity growth on what he terms a "technology overdose," Stephen S. Roach, principal and senior economist at Morgan Stanley & Co. in New York, is sounding more optimistic. The story goes like this: Back in the roaring '80s, America's service sector was annointed as the next great growth phenomenon. While the manufacturing sector was wheezing along at flat to negative growth rates, robust service companies were expected to provide prosperity and usher in the information age for the United States.

But a funny thing happened on the way to the future. Although airlines, banks, utilities and other service providers invested heavily in an IT infrastructure, anticipated productivity payoffs did not result. Instead, companies found themselves with a massive fixed cost around their necks. They also found themselves a critic in Roach, who has spent much of the past decade condemning the service sector's overinvestment in technology.

Now, one recession and a lot of pruned corporate deadwood later, the productivity barometer is finally measuring some positive results. *CIO* Senior Writer Carol Hildebrand recently talked with Roach to get his take on the new numbers.

CIO: *You've long been a critic of IT overspending by the service sector. Now, however, productivity numbers seem to be on the uptick. What's going on?*

ROACH: I stand by my complaint of 10 years ago. For most of the past decade, the service sector was very complacent. Its reckless acquisition of machines and open-ended hiring practices built up bloated excesses in the cost structure. There was no sense of cost-efficiency within this expansion.

It's not the fault of IT. What caused it was the lack of any significant competitive pressures. The service sector was protected by regulations, and there was a dearth of foreign players. Many service com-

PHOTOGRAPHY BY JOHN RAE

panies could take market share for granted. They weren't threatened, so they could get away with [inefficient management practices.]

Basically, [corporate America] was faced with a culture of managerial ineptitude.

Finally, competition heated up phenomenally in the service sector, leading to a huge shakeout there. Out of the shakeout are coming hopeful signs that white-collar productivity is finally breaking out of stagnation, and companies are being forced to learn how to make technology work.

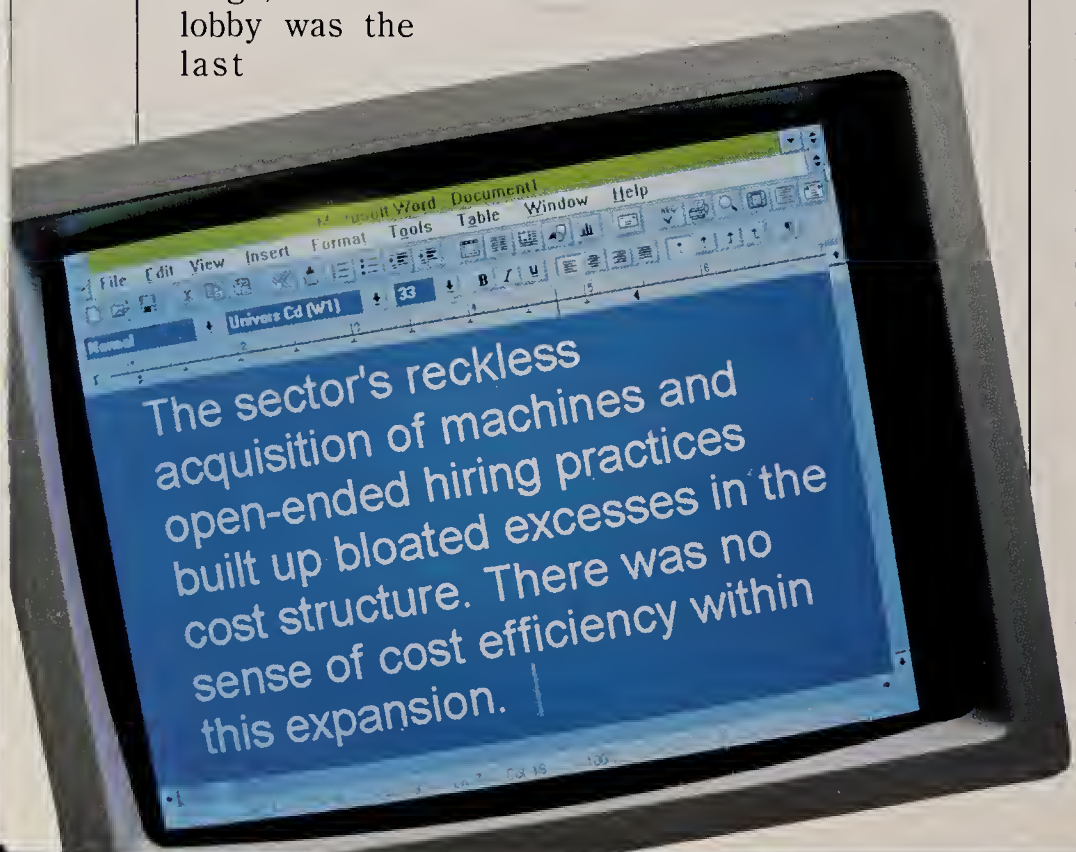
CIO: *What brought on the shakeout?*

ROACH: It was a combination of things. First of all, competition jumped as false barriers that previously guaranteed market share broke down. Regulation gave way to deregulation, so we had new players entering such domestic service markets as telecommunications and cable TV. Foreign companies were entering those markets as well by means of investments in the service sector. All these shifts occurred against a backdrop of gathering recession. The service sector had to restructure or perish, in many cases.

The whole thing was a recipe to force service managers to do business differently. In this environment, managers simply cannot afford to stay wedded to open-ended strategies of employee hiring and IT buying.

CIO: *Has IT been part of the problem in the service sector? Can it be part of the solution?*

ROACH: We're here to stay in the information age; we are not going to turn the clock back. IT is a critical tool if used effectively and cost-efficiently. My strongest criticism of IT is that for most of its long history, the service sector was composed of flexible, low-cost producers whose main asset was people, who could be hired and fired as needed. If business got tough, the elevator ride to the lobby was the last one. Today, the industry can still hire and fire white-collar workers, but what's left behind is a massive IT infrastructure. I estimate that $862 billion has been spent on IT in the service sector during the past 10 years. It has had the effect of transforming what was formerly a variable-cost sector into a fixed-cost environment, and that's how it has become part of the problem—if it's not managed effectively. It's possible to manage advantages as well as the pitfalls.



The sector's reckless acquisition of machines and open-ended hiring practices built up bloated excesses in the cost structure. There was no sense of cost efficiency within this expansion.

CIO: *How would you manage more effectively?*

ROACH: Basically, the days are gone when you could embark on general IT-acquisition programs. Instead, IT needs to be directly tied to measurable payoffs. Number one, you need to figure out how to measure productivity in white-collar functions. Managers need to focus on the seemingly mundane, rank the various white-collar tasks and find a way to measure their importance and productivity level. That's not done. Many times you can go into a service-sector organization with a large IT installation and they admit that measurement is not precise.

Number two, you need to be able to link an effective productivity payback with every technology application. You need new metrics, but once they are in place, you also need to make sure that the productivity return is there.

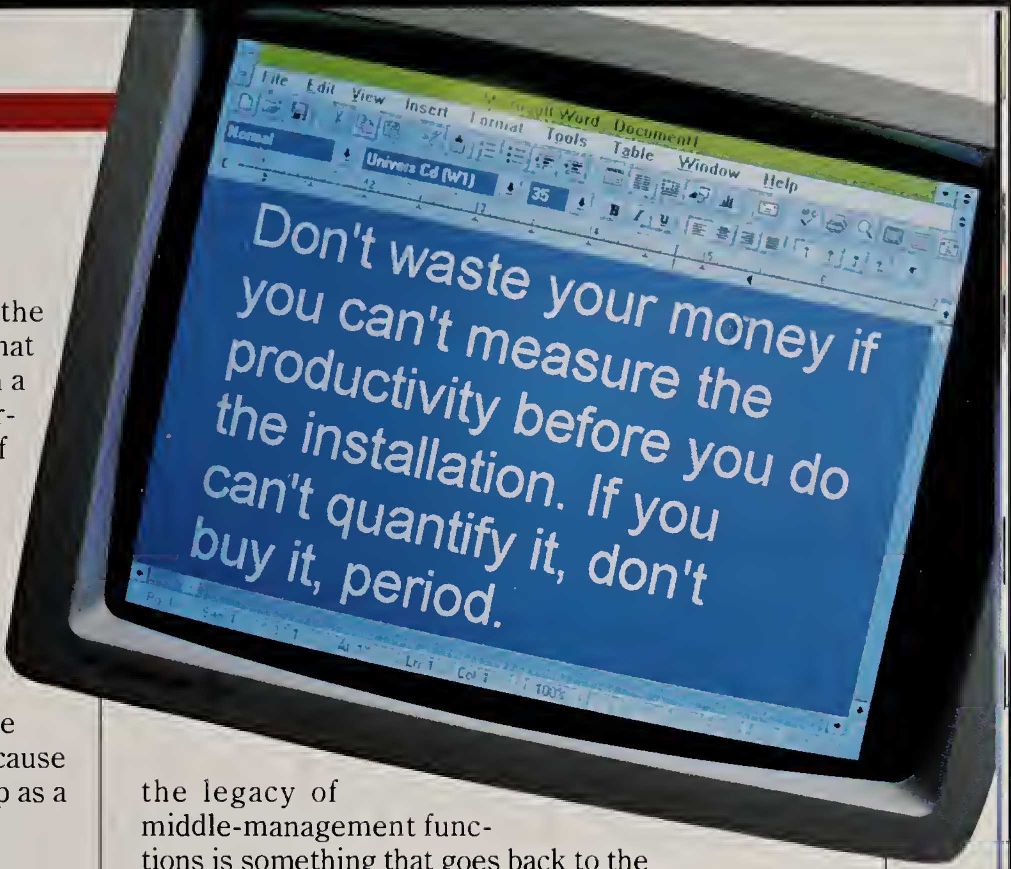
The important thing is, don't waste your money if you can't measure the productivity before you do the installation. If you can't quantify it, don't buy it, period.

CIO: *So, how does management learn to measure productivity?*

ROACH: I'm not looking for the ultimate metric that gives a highly precise measurement here. I'd be satisfied with a simple, hierarchical ranking of tasks according to their value-added worth. A classic example is banks. If bank managers could give a list of the top-10 activities that add value to the bottom line, I would be thrilled because that system of priorities should govern IT acquisition. This has not been the case.

Many banks have created massive technology [operations] for such huge transaction-processing functions as check clearing. Banks spend 90 percent to 95 percent of their IT budgets on such low-value-added processing. Meanwhile, only a small sliver of the budget is spent on such high-value-added functions as trading, stock swaps, etc. If banks knew what their internal productivity requirements were, they would not have automated in that order. They would have done it the other way around.

CIO: *It seems that the productivity changes could have resulted from more than technology. For example, with the current downsizing trend, many companies have fewer employees doing more work. What other factors do you see contributing to the productivity increases?*



Don't waste your money if you can't measure the productivity before you do the installation. If you can't quantify it, don't buy it, period.

ROACH: I put several different reasons behind the upswing. The cost-cutting and restructuring that have occurred in the corporate world have been a big factor. The trend toward process reengingeering has also played a role. The increased level of IT generally is a third factor, and the fourth is that of fewer people working harder and longer.

Here's an example: As large parts of the country get hit with job pressures in this recession, white-collar workers are getting hit with greater job loss. The result is that the survivors are sensing that something very different is occurring in the job environment, and they are not taking a sense of job security for granted. Because of this, they'll work harder, and this could show up as a measure of productivity improvement.

CIO: *And reengineering? Isn't IT a huge factor there?*

ROACH: Reengineering really involves the rethinking of a process. Technology can be a big factor in that, but it's not the driving force. It can be a facilitator in encouraging management to revamp processes, and in fact there are some business-process redesigns that would not have occurred had it not been for IT. But reengineering is *not* trading workers for machines. The real driver behind productivity improvement is the reengineering process, and IT facilitates that process.

CIO: *Much of the technology in the service sector was originally installed to automate back-office functions. This is now the very equipment that is going out the door to outsourcers. So, what role can IT currently be playing in productivity gains?*

ROACH: A number of things. First of all, consolidation. For example, when two banks merge, one of the first things to go is a back office. Now the merged bank can utilize economies of scale and apply surviving capacity to a much larger base. Many of these data centers had so much redundant capacity that one center can supply the larger base efficiently.

Many organizations with process-intensive functions are jettisoning the back office completely and buying back the services in the form of outsourcing. I think outsourcing is here to stay. It allows organizations to get a fixed-cost function off the books and then buy it back. Outsourcers can then provide IT on a variable-cost basis.

Another point: Technology is beginning to be used at more-strategic levels—for example, the sales function. We've been seeing sales workers being increasingly equipped with powerful point-of-sale computing devices. This gives them greater productivity leverage, and the trend has reached critical mass in the last several years.

Companies are also utilizing technology as a vehicle to facilitate the mid-management squeeze. I think that the legacy of middle-management functions is something that goes back to the early post-war era. Companies could get away with these layers as long as they were not held accountable for the bloated cost structure by leaner companies. That has changed, and people can cut down on that structure because of technology. A lot of labor-intensive paper-shuffling is being eliminated by internal commmunications-type technologies, enabling fewer managers to work more efficiently. For example, if you have interlinked global-telecommunications networks, the need to have humans doing a summary of global reporting at the home office is really redundant.

CIO: *You've said before that managerial positions can't really be made more productive by technology. Why not?*

ROACH: I'm talking about one chunk of the white-collar workforce: the knowledge worker, the surviving executives. In theory, this is where the big bucks are made. Here, despite all the great hoopla about artificial intelligence, CAD/CAM, etc., in large part technology has not really led to breakthroughs in productivity. I have to question whether every knowledge worker in America needs a fully networked workstation, which is very expensive.

CIO: *Will IT assume a different role in the future?*

ROACH: Yes. Most importantly, I see it becoming incorporated into strategies of corporate survival. Gone are the days when you just did technology because it was fashionable. There are Luddites who say that we need to go slow on technology because it's costing us jobs, but I don't buy that. Technology-driven job displacement is a very myopic interpretation of what can occur, and it overlooks real opportunities for job growth by a company or a country over the longer haul.

If we continue to stress technology in productivity applications, then I think companies will become more competitive. That improved competitive position is the most powerful medicine we have for job creation because companies will be able to expand their market share and broaden their scope as a result.

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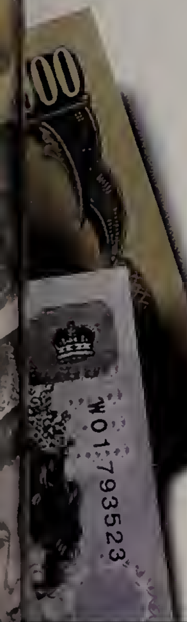

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THE TRUTH ABOUT *Turnover*

Sure CIO turnover is high, but it's not exactly open season on IS executives. And those who do find themselves out of a job can take comfort in the fact that being fired is not the anathema it once was.

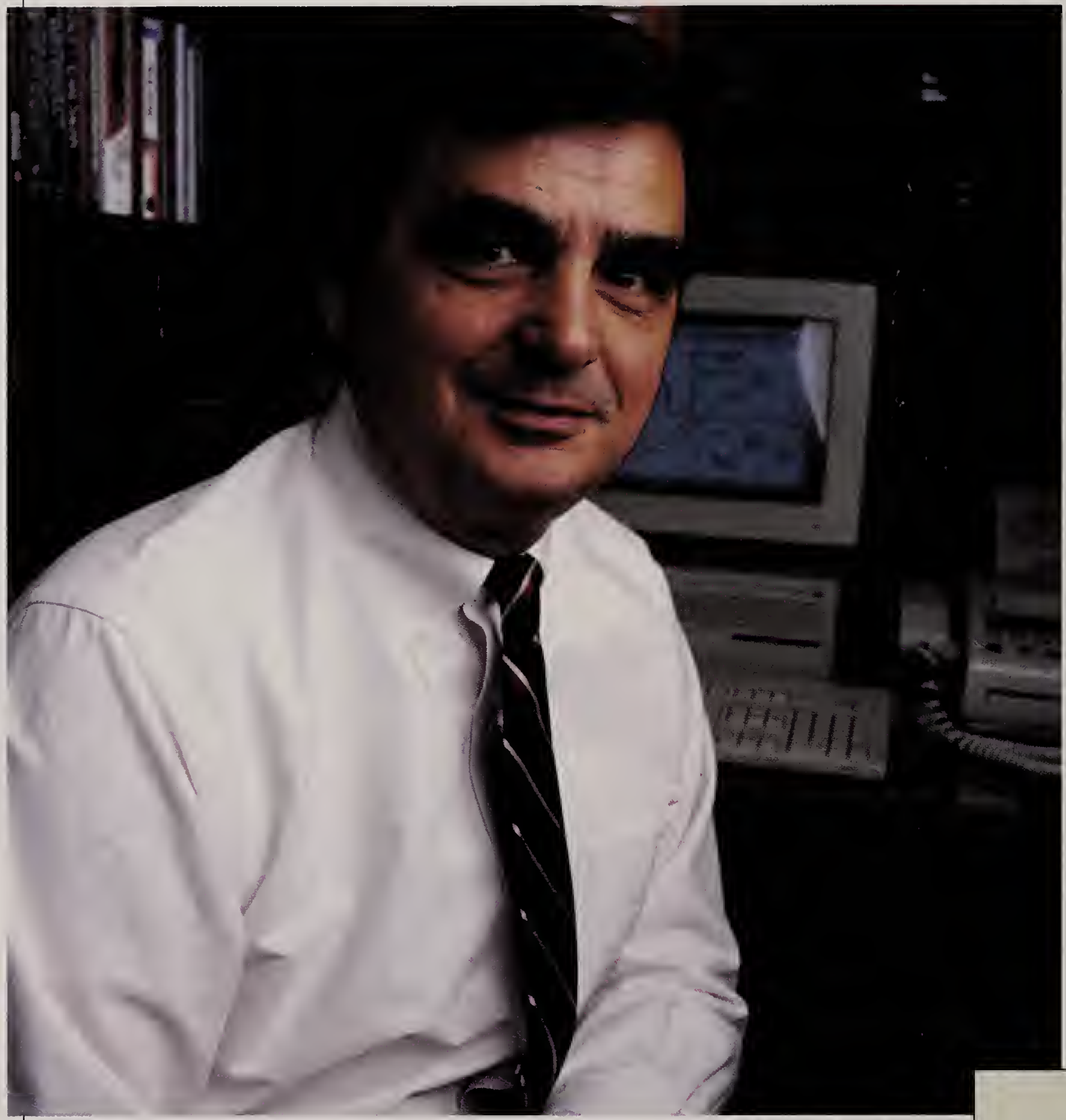
Revolving door? What revolving door? Who says that CIO stands for Career Is Over? What's wrong with a job that lasts five years, pays well and, as often as not, leads to something better?

Flying in the face of conventional wisdom that pegs longevity in the IS chief's slot at somewhere between 18 months and four years, recent studies have found CIOs remaining in their jobs closer to five years, with nearly one-quarter holding the same positions longer than eight. (See related story, Page 46.) That's hardly lifelong security, but it's comparable to what other executives are experiencing.

BY MICKEY WILLIAMSON

PHOTO BY KENT HANSON

JOHN GIGERICH *notes that ambiguity inherent in the CIO role may add to its insecurity.*



RON BRZEZINSKI *observes there's plenty of executive company on the turnover track.*

PHOTO BY DAVID WAGENAAR

“Yes, CIO turnover may be high, but so is [turnover in] every other position,” says Ron Brzezinski, principal at Transformation Associates, an IS consultancy in Wilmette, Ill., that focuses on organizational change. “Companies are struggling to change, and they're going after those areas where they think the change will help the business most.” That area may well be IS, but in many organizations the sales vice presidents are getting the ax, Brzezinski says. “The CFOs are getting it, and we're seeing a lot more CEOs, whose positions used to be nearly sacred, getting it too.”

> *“If you're a change agent, you'll probably have a three-to-five year time span with your company.”*
>
> *–Ron Brzezinski*

Whatever the frequency with which IS executives change jobs, the fact that they do so means opportunity exists for those who are dissatisfied where they are. David V. Evans, vice president and director of IS at retailer J.C. Penney Co. Inc. in Plano, Texas, says he gets about one call a week from executive recruiters with positions to fill, despite the fact that he isn't interested in moving. “I've been offered jobs that would more than double my salary, and I just don't think it's worth it,” says Evans, who has been with his company for 29 years and in his current position for six.

It's a question of whether the glass is half full or half empty. For David Reff, who heads the executive search firm David Reff and Co. in Dallas, it's half full. Reff, who specializes in recruiting CIOs and those who report directly to them, says he is busier than ever. “There's more demand than there has been in previous years,” he says.

A Match Made in Heaven

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Ron Brzezinski, a former CIO at the Quaker Oats Co. and now principal of Transformation Associates, change consultants in Wilmette, Ill., has a theory about the in-

When CEOs get frustrated with the way business is going, "an easy solution is to fire the CIO and bring in somebody new."

Unquestionably, information technology contributes to any company's financial results, but that's a long way from controlling the bottom line. And CIOs are fired for other reasons that have nothing to do with their performance. The CIO who has been unable to convince the company to invest in infrastructure may become a target, says Brzezinski. Or a new CEO may come in and sweep the next-lower level clean. Also, when two companies merge, "there are essentially two positions for every one that's required," says a between-jobs CIO, who was fired under those circumstances. It didn't take him long to find a new position, but he left that one out of disgust with a CEO who cut the IS budget first every time a financial crunch loomed. "By hitting us harder than the other functions, he sent a message to the rest of the organization," he says.

John Gigerich, now vice president of information services and CIO at Union Carbide Corp., in Danbury, Conn., is one IS chief who worked his way out of a job. As CIO at Continental Bank in Chicago, Gigerich proposed to his CEO that the entire IS function be outsourced. "There were other things [at Continental Bank] that the CEO wanted me to do, but they were of limited interest to me," Gigerich says. So he engineered the changeover and left a month before the final contract was signed.

Gigerich says that one factor in high CIO turnover is the position's ambiguity. "A CIO has a dual kind of job. He's a line officer in the sense that he has a lot of people, machines, resources and assets under his control. But he's staff because he supports all the other businesses within the organization, and he cannot be successful unless all the rest of the organization believes he has done a good job," he explains.

The fact that every corporate function depends so heavily on IS can translate into hostility toward the department, and especially toward the person who runs it, Brzezinski points out. IS isn't the only service organization within most corporations: Human resources and research and development have a similar status. But R&D represents the future of the company, and there are plenty of ways of getting around the HR department if, for example, it doesn't find candidates for an open position quickly enough. While many people did an end run around IS to buy personal computers, on the other hand, now they're dependent on IS again to get those PCs hooked up to the data they need. "Human-resources VPs seem to last a lot longer than CIOs," Brzezinski observes. "The reason is [that] they are not in the path of somebody else who is trying to get something done."

> *"A CIO could be getting accolades in the IT field, but if he's viewed as non-supportive or a troublemaker, he'll probably be invited to work somewhere else."*
>
> *–John Gigerich*

Too often, Gigerich says, the CIO's longevity in the company depends on a kind of popularity contest. The IS chief's peers can be arrogant and difficult to get along with, but if their branches of the business make money, they are seen as successful. "A CIO could be getting accolades in the information-technology field, but if he's viewed as non-supportive or a troublemaker within the organization, he'll probably be invited to work somewhere else," Gigerich says. "In a sense, everybody gets to vote on whether the CIO stays around."

teraction between CIOs and their immediate superiors. The theory applies just as well to other boss/subordinate relationships and sheds light on the causes of turnover at any level.

Brzezinski calls this the Big-C/little-c syndrome.

Big-Cs are leaders and visionaries, he explains. They strive for continuous improvement and positive change. Little-c types have a custodial mentality. They are task-oriented and change-averse.

The combination of a Big-C superior and a little-c CIO leads to frustration for the CEO and mixed messages to the corporate staff. Large-scale change will be hard to bring about, and eventually the CIO will be sent packing.

Ego conflicts, public quarrels and petty politics result when a little-c CIO works for a little-c boss. A zero-sum mentality prevails, and the company is the ultimate loser, Brzezinski says.

A Big-C CIO finds little if any support from a little-c superior. Frustration is the CIO's lot, change means political risk, and the CIO is apt to go elsewhere, seeking an opportunity to make things happen.

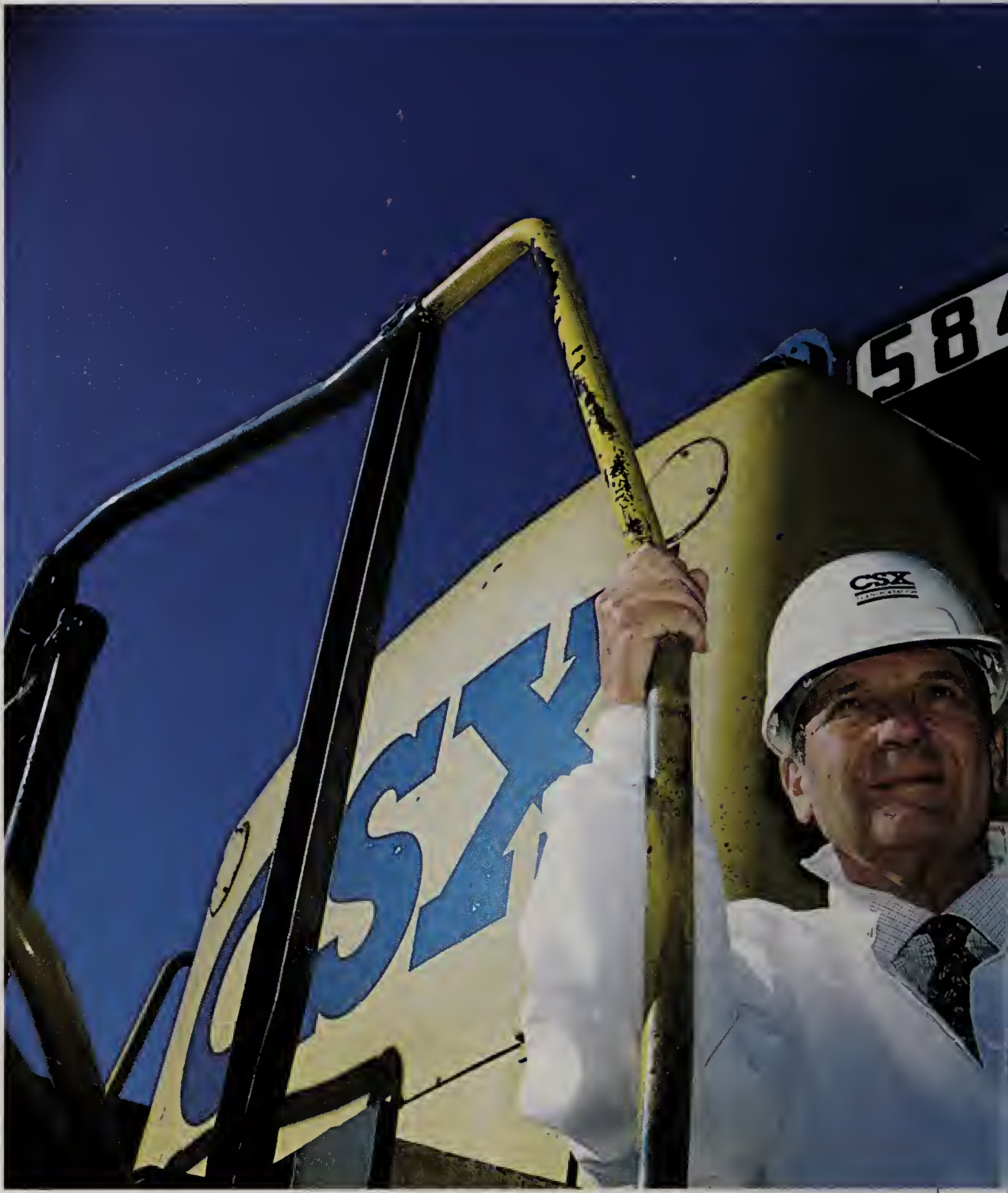
Only when a Big-C CIO finds a Big-C superior does constructive, continuous and beneficial change result. The whole, in this combination, is greater than the sum of its parts, says Brzezinski.

IS executives evaluating their own careers would do well to consider where they and their superiors fit in this scheme. The same is true for those contemplating a change of employment.

–M. Williamson

To be sure, some job losses stem from the IS chief's personal shortcomings or mistakes. One mistake is simply the failure during the interview process to assess the company or position realistically, therefore going into the job blind. The between-jobs CIO says that these days he spends more time "probing the culture" of companies he is applying to by obtaining "a kind of market intelligence from other people in the industry." Also, he wants to know the CEO's goals for the department and how supportive he or she will be of the CIO in accomplishing those ends. "I spend a lot more time investigating the personality of the person I'd be working for, by getting references on the individual from external sources," he adds.

> *George Sekely offers three rules for longevity: "Don't waste money, deliver the essentials and don't bother the boss."*



GEORGE SEKELY: *Changing jobs can be the shortest distance between opportunities.*

PHOTO BY JUDITH GEFTER

Gigerich says the CIO's most common personal failure is to forget that internal clients are clients nonetheless "and that you only exist and have value if you create value for them." He gained that insight during the year and a half he spent as an independent consultant after leaving Continental Bank. "It was an enlightening experience that I hope I never forget," he says, "trying to work through a very complex problem with the CIO and hearing him or her say of the [internal] customer, 'They don't know what they're doing.' And I'd say, 'Yes, but they're the customer. Here's the business problem they're trying to solve, and it's our job to solve it.' Then I'd get on an airplane to go home and realize that I used to take those same positions."

Sometimes, like the classical tragic hero, CIOs hold in their characters the seeds of their own destruction. This is most apparent among IS executives who, by nature of their entrepreneurial spirit, are hired to be the corporation's agent of change. Typically, Brzezinski says, CIOs who fill this role should not expect to be around once the change is accomplished. Because most major corporate change takes three to five years to complete, Brzezinski says, "if you're a change agent, you'll probably have a three-to-five-year time span with your company." The reason: Change agents disrupt the status quo and, by doing so, create "political nonallies."

To be sure, some CIOs may relish the opportunity to come into a company, redesign the way business processes work and then move on to the next challenge. But even those who don't may be asked to leave, says Brzezinski. "If you're perceived as a change agent, and the company gets to a point where management decides it's time to stabilize, you may be accused of advocating [new] technology for fun and games," he warns.

Ironically, he says, since change

begets change, it's likely that others at the executive level will leave, and that their replacements will see the CIO as part of the old, change-averse establishment

Behind all the handwringing over CIO turnover is the assumption that switching jobs is inherently bad. George Sekely, senior vice president of CSX Transportation Inc. and president of CSX Technology, in Jacksonville, Fla., scoffs at that notion. Sekely left CP (Canadian Pacific) Rail System nearly two years ago to head the IS organization at CSX. His assignment: to "get the most bang for CSX's IT dollars, lay the technological groundwork for the company's future" and eliminate overtones of bureaucracy in IS's dealings with the business units.

"This is a sunset assignment for me," says Sekely. "I spent 20 years at Canadian Pacific and was scheduled to retire in 1995 when this job came around. Some people would say I was crazy to change jobs at that point, but it looked like a good opportunity to go out with a bang, so I took it."

Sekely, who says he has never been known for his political skills, finds refreshing freedom in the fact that he will retire, at 65, next year. "I'm in a wonderful position because [people] know I don't have political

Must Be Able to Walk on Water...

Often, CIOs and executive recruiters agree, senior executives have overly optimistic expectations of their CIOs. What follows are extracts from the CIO's job specification at a major manufacturer. The position was being filled as this article was in preparation, at the end of 1993.

Major responsibilities:

- ...will work with the Executive Committee and other senior-level executives...to develop...[the IT organization's] strategy and business...as a competitive weapon.
- Must have the...demonstrated track record to influence major change and transformation in a large, decentralized [organization] involving multidimensional issues.
- Will ensure that the [IT organization] is totally integrated, maintaining strong linkages to key functional entities....
- ...will contribute the knowledge of where [IT] can improve business processes. Will be responsible for ensuring [that] business management understands and makes use of appropriate information technology....
- Must be skilled and respected in dealing with external...customers; should possess the personal qualities to engage people, i.e. ease of communication, openness.

Experience and personal characteristics:

- ...strong general manager, respected technologist, strategist, visionary, change agent....
- ...the personal and professional stature required to successfully interact with senior executives at Fortune 500 companies.
- ...excellent influencing skills....
- ...understands the dynamics of change management....
- ...a global understanding of the competitive issues confronting [a] multinational organization....

ambitions. That makes it very easy to get cooperation, and I'm having fantastic fun at it."

For those who aren't that close to retirement and want to stay where they are, Sekely offers three rules for longevity: "Don't waste money, deliver the essentials and don't bother the boss."

Sekely believes that the corporate economy should be the CIO's primary focus. "Once you've demonstrated that you're contributing to the common cause, [people] will listen to you in other areas," he says. For example, Sekely has convinced his peers of the need to settle on a single class of personal computer and a single brand of spreadsheet program and word processor. He did this by explaining that although other tools may have the same capabilities, adopting two different products means lower vendor discounts and the necessity of paying twice as many people to support them. His peers see the logic in that, and trust him to make the selection.

As for not bothering the CEO, or whomever the IS executive reports to, Sekely says, "find yourself a boss you resonate with, one with whom you can communicate in very few words." Remember, he says, that a chief information officer is like the captain of a ship. The manager at the shipping company the captain works for doesn't want to hear about icebergs and the low coming up from Bermuda; he wants to hear that the cargo reached its destination safely. Once you know your destination, you may want to feel your superior out on major spending decisions, "but don't go beyond that," Sekely advises. When people say they have trouble communicating with the boss, he adds, "I wonder, what are they trying to tell him? Why do they think they have to communicate with him?"

By the Numbers

There's good news and bad news...

Just how bad is employee turnover? Recent surveys by the Chicago-based Society for Information Management (SIM) and the IT consulting service of Deloitte & Touche in New York arrived at nearly the same figure from two different directions.

The SIM survey asked top IS executives how long they had been in their current positions. A weighted average of 259 responses came to slightly more than five years. Deloitte & Touche, on the other hand, looked at IS chiefs who had been displaced and found their tenure was just under five years. In addition, the SIM study showed that 23 percent of those with the title of CIO or equivalent had held that position for eight years or more, and three of SIM's 259 respondents had been on the job for more than 20 years.

Deloitte & Touche found that the turnover rate among CIOs increased by 20 percent between 1992 and 1993. By contrast, SIM, which last asked the same questions of incumbent CIOs in 1991, found very little change in two years. On the downside, Deloitte & Touche found that one-third of those who had left the CIO position had done so unwillingly. SIM didn't ask that question.

–M. Williamson

Reff, the executive recruiter, describes a two-step program that CIOs can use to boost their status within the company. First comes an absolutely honest self-inventory, aimed at identifying the CIO's own strengths and weaknesses. That done, the next step is to hire subordinates who are talented where the CIO is deficient—at keeping up with technology, for example, and showing how to apply new advances to meet the company's needs.

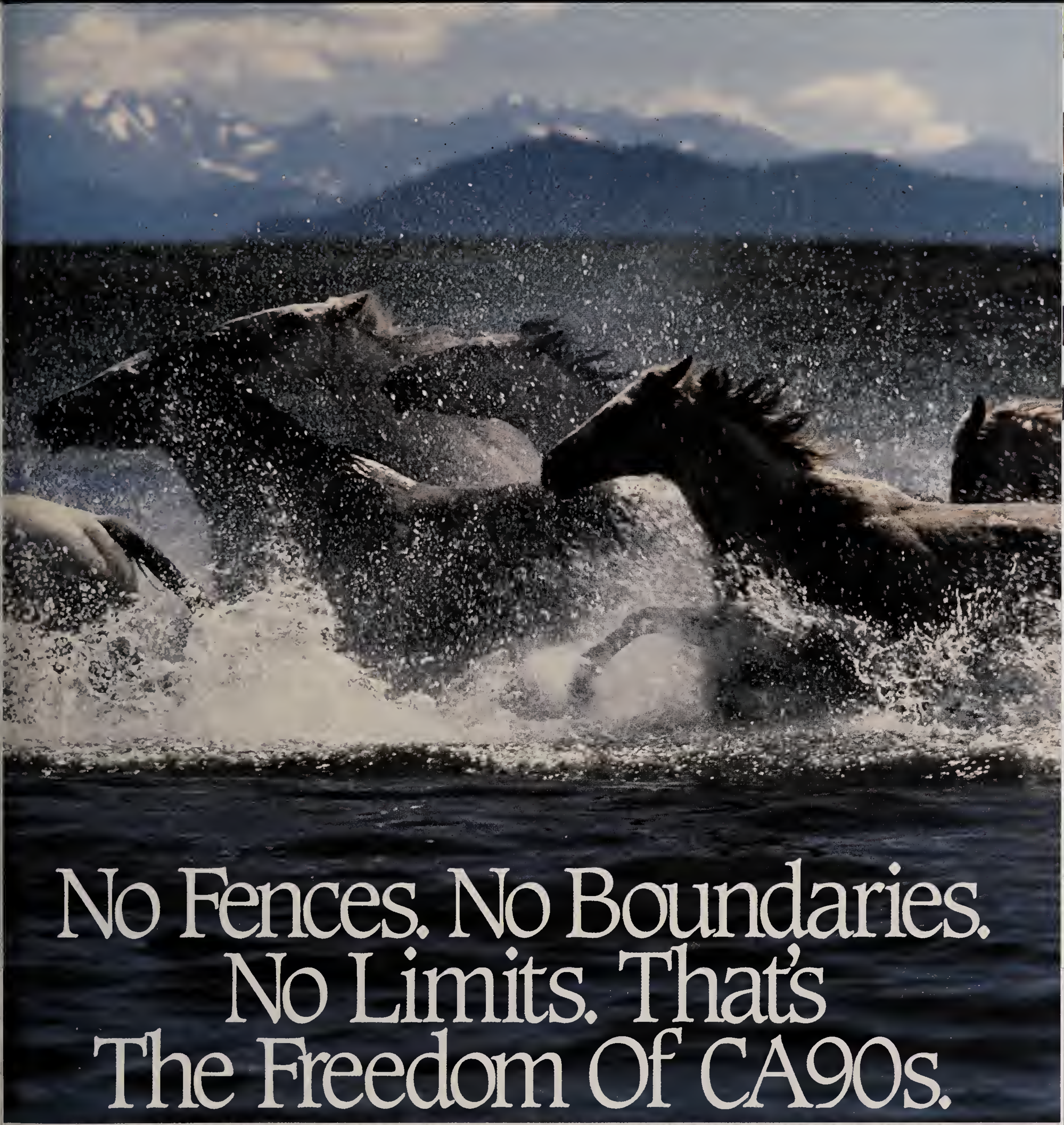
Too many IS executives are afraid of being upstaged by their employees, says Reff. "Fear paralyzes so many CIOs, but it doesn't have to be that way." The really outstanding CIOs are those who gather around themselves the most-talented subordinates, he explains.

For the one-third of CIOs who leave their jobs unwillingly, the question inevitably arises: Is there life after CIOhood? The answer is almost invariably yes. Brzezinski served as CIO for The Quaker Oats Co., then spent some time with Coopers & Lybrand as a partner in charge of IS strategy and planning before striking out on his own. He says he has no intention of being a CIO again because he thinks there are real opportunities for people like him, who know how to "manage change from the outside and help CIOs be successful even if they don't fall into the change-agent category."

During his stint as an external consultant, Gigerich had a "fine, exciting time and swore I'd never be a CIO again." But then Union Carbide, one of his clients, presented him with a challenge that was "exciting and enticing enough to lure me back into the game as CIO."

Maybe all the consternation over CIO turnover is a relic of days gone by. "Until recently it was considered not nice to change [jobs, as though] something's wrong with you," Brzezinski says. "Today, it's in vogue. It's the latest thing to do." CIO

Mickey Williamson is a technical journalist based in Warwick, Mass., who specializes in emerging technologies. She heads the Qwerty Group.



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HOW TO CREATE A BUSINESS DRIVER

Ryder CIO Dennis Klinger believes the best IT systems have one thing in common: top-drawer business-unit leadership. Over the years Klinger has refined a methodology for turning IS skeptics into system sponsors. Then, once he gets their sleeves rolled up, he puts them behind the wheel....

BY CAROL HILDEBRAND

RYDER SYSTEM INC.'S Andy Anderson once spent two years on the rubber-chicken circuit selling a prospective new IT system to the truck-rental giant's 4,500 independent dealers. Anderson was so excited about the system demo, he says, "that I even showed it to my grandmother."

Just part of the job for your typical IS evangelist, right? You bet.

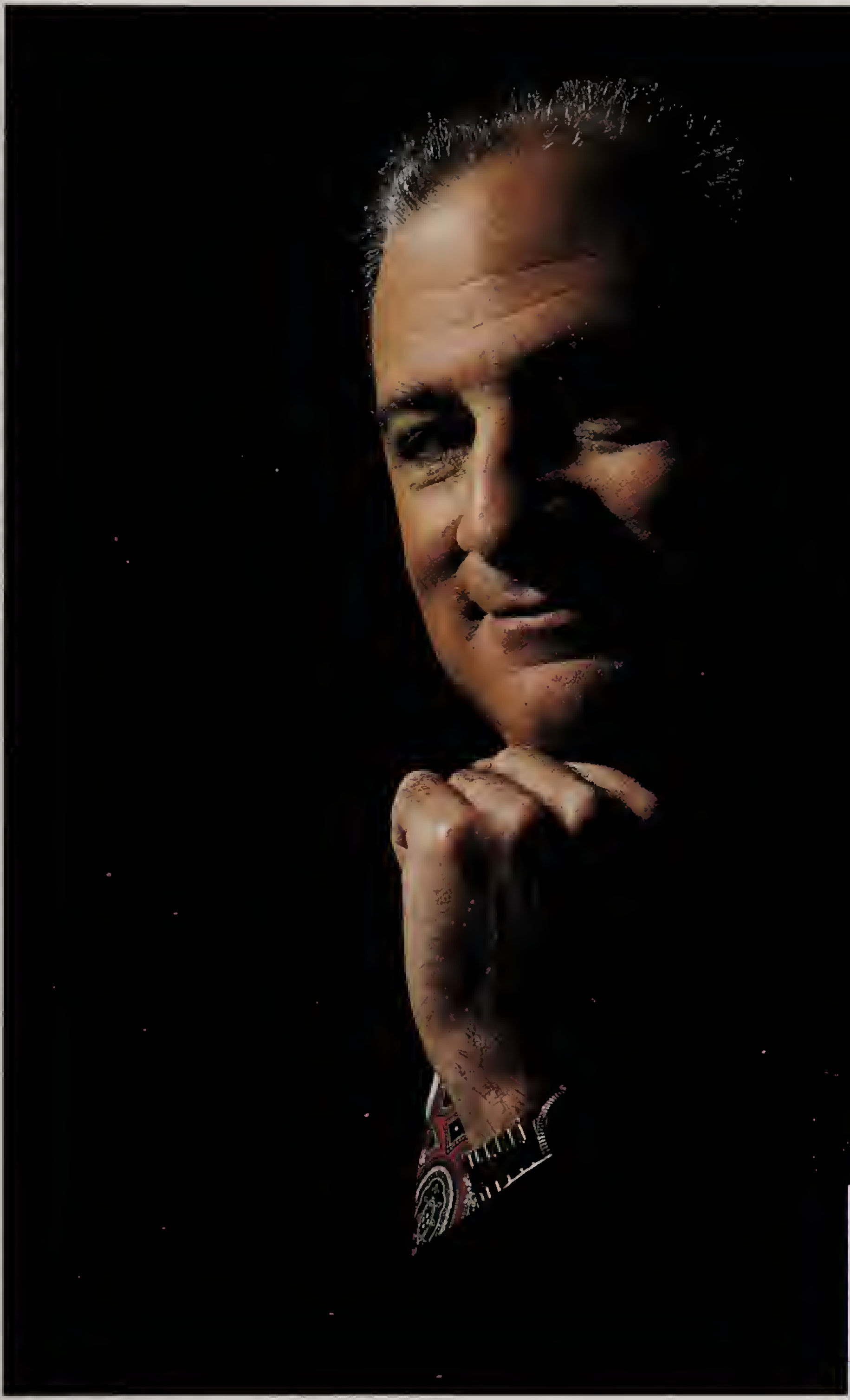
But Anderson isn't an IS worker at all. He's a user. As the director of consumer-rental operations at Ryder Consumer Truck Rental, he became an early convert to an IS methodology that not only emphasizes business partnerships in project development and implementation but encourages business executives to take a leading role in such projects.

Dennis Klinger, vice president of MIS at Miami-based Ryder, says that the methodology grew out of his conviction that it's vital to get the business community to "own" the system. If you don't, he says, "sooner or later, you'll have a difficulty."

It has worked: Since 1986, when Ryder's first companywide system was conceived, the Ryder IS staff has refined its methodology, implementing incremental advances with each of three major projects. In the process, Ryder has weaned itself from antiquated paper-based systems and embraced technology. Now, with a companywide reengineering initiative underway, the methodology has gained CEO-level corporate backing.

The impetus for change at the $4.2 billion company grew out of a traditional bugbear: Increased competition drove Ry-

PHOTO TOP RIGHT BY DEBORAH GRAY MITCHELL. PHOTO BELOW RIGHT COURTESY RYDER SYSTEM INC.



"We're doing systems and technology things with people who've never done this stuff before. So whatever it takes to get them involved, I'll do it."
–Dennis Klinger

der executives to find new ways of shoring up profits. One method was to pull Ryder out of its many paper-based business processes, which kept executives from translating important business data into competitive tactics on a timely basis.

Anderson says that as business pressures grew, "we realized that we had the information we needed to improve profitability. But we couldn't get to it without automation."

However, before IS would be able to make a difference, Ryder employees first had to learn to look at IT as something more than an expensive calculator for accountants. "As a company, we didn't see its value. We downplayed IS as a necessary evil," Anderson says.

Confronted with this skeptical attitude, Klinger reinvented his IS staff to work as both an outreach program and a business partner. "On the organizational chart," Klinger says, "I have a director lined up with each divisional president or executive-committee member, and project managers lined up with each business area." It is the man-

ANDY ANDERSON *(left) and* **GERALD RIORDAN** *represented the business side in the development of the RyderFIRST system.*

PHOTO BY DEBORAH GRAY MITCHELL

agers' responsibility to attend the staff meetings of those units, like any other member of those business units, he says.

Klinger tries to get his project managers to think like account managers, even to the point of giving them sales training. When a big IS project is approved, he announces it to his staff with lots of fanfare—"Like, 'Hey, we just won this big account!' "

Klinger doesn't mind taking on the role of the Grand Persuader. "I'm not proud," he says. "We're doing systems and technology things with people who've never done this stuff before. So whatever it takes [to get them involved], I'll do it."

What it has taken for the past seven or eight years is a mixture of determination, cajolery and hard-won credibility. Klinger cites three projects as the proving grounds for his methodology.

PROJECT NO. 1

The development and implementation, starting in 1989, of Ryder's Financial Information System—FIS—was the shakedown cruise for Klinger's partnering strategems. The system computerized business processes for the entire commercial-rental division and virtually all Ryder-owned rental outlets (which amount to about 20 percent of the total of consumer-rental sites). Encompassing about 80 geographic districts and 400 branch offices nationwide, FIS was the biggest project Klinger's group had yet developed.

The goal was to replace an aging and inadequate distributed-management system, which Klinger says was becoming difficult to maintain. In addition, it transformed rental operations at the company-owned dealerships from a paper-based process to a completely online environment, and it also partially computerized the billing and marketing support functions.

During FIS's development, IS first tried a number of the practices that now make up the core of its partnering methodology. For starters, the project was put under the aegis of a formal steering committee, consisting of high-level business executives and IS staff members, which had start-to-finish control of the project. Second, employees from the business units that would use the system were assigned full time to the development team, becoming employees of that group. Finally, when the time came to roll out FIS, Klinger's team reached out into the business units and tapped workers from various field offices to help with the implementation.

So, for example, a controller at a district office might end up doing training and implementation of the system. This was not merely a trivial interruption of their usual duties; the rollout took three years, so these employees in essence gave up their field jobs (although they were guaranteed positions of equal value at the end of FIS's implementation period). At one point, Klinger says, his staff had almost 40 business-unit employees working on the implementation.

Extensive involvement of non-IS staff was essential to giving the business units ownership of the system, says Klinger, adding that he was able to secure such line-business support because the steering committee threw its collective weight behind his partnering strategies. The system was piloted in selected cities before the actual rollout, giving IS staff advance user feedback so the system could be tweaked.

Klinger and his IS staff also created two tools to manage the project rollout. The first was the "war room"—a kind of command center for the project-management team. Klinger brought in consultants from KPMG Peat Marwick, who spent six weeks helping IS hammer out the war-room design and structure the project-management team. IS and KPMG built a "cookbook" for each function to follow. The implementation was broken into 250 activities; each activity followed a basic recipe, fostering a consistent approach as team members scattered across the country.

Klinger scoured the business units once again to find an executive to head the war-room operation. He chose Ben DiNatale, group director for field systems implementation and systems assurance, a former district controller with extensive field experience. "He didn't know project management, but he did know the business," Klinger says. "So we taught him project management, and he's rolled out several systems for us."

The second thing IS did was to build a support hot line for new FIS users. The hot line ran five days a week and served as a backup tool for the initial training effort. Klinger says it was also a good source of feedback to better design training efforts.

After FIS was in place, the development group held a post-mortem to look at what could be improved upon in the next effort. For example, Klinger found he had learned some key lessons about timing. "With FIS, I went to the board too early and told them more than I really knew about the project," he says. "Now I realize that I don't have to know the end of a project to [secure] a commitment to the beginning."

The experience also strengthened his ideas about the value of working as a team with his clients in business-unit management. "Bad news sells best early," he says, "and it's much better when the client's on the team with you. That way, you own the 'surprise' together."

PROJECT NO. 2

Klinger's group used the experience base of the FIS project to help refine the business partnering model for RyderFIRST, the next big effort. The proposed system was conceived to help buttress the sagging profits of the consumer-rental division. It computerized order entry, sales, marketing and inventory management, replacing separate paper-based systems with an integrated online system. Through RyderFIRST, the company keeps much closer tabs on the availability of its fleet (see related story, below).

Drawing from the data gathered at the FIS post-mortem, Klinger sought both a more-formal planning process for the project and a senior executive who really knew the business to work extensively on it. Gerald Riordan, president of the consumer-rental group, assigned Anderson to work with Klinger.

Although Anderson knew the business side, he had to be converted to Klinger's partnering methodology. The project plan called for weekly review sessions of the development team, which included IS, market-

Where the Rubber Meets the Road

Dealer acceptance of one system shows how a partnering methodology can help IT approaches to solving business problems work harder

Unlike the car-rental industry, the truck-rental business has traditionally relied upon networks of independent dealers—often gas-station owners who handle truck rentals as a side business. Because they operate independently, these dealers have tended to run the rental business without the benefit of computerization. So, like its competitors, Ryder faced a dealer network accustomed to doing business the old-fashioned way: on paper forms.

Under the old system, handwritten rental agreements were sent weekly to Ryder's Miami headquarters. There they were keyed into the corporate mainframe and compiled into fleet-status records. This data was then sent back to the regional offices and from there to the dealers. Since the process could routinely take more than a week, a rental truck "would frequently get to its destination before the data about it did," says Andy Anderson, director of consumer-rental operations at Ryder Consumer Truck Rental.

These days, under a system known as RyderFIRST, PCs at each dealership are linked via regional IBM Corp. AS/400s to the mainframe at headquarters. With RyderFIRST, not only does headquarters get up-to-date information on the status of its fleet of trucks, but rental rates can be changed daily on a regional basis. Because the company has much more accurate data, it can use its trucks more efficiently. In fact, says Anderson, the system has boosted truck utilization by 4 percent during the two-year implementation phase. Since that translates into about $30 million, RyderFIRST has already recouped its more-than $20 million price tag.

–C. Hildebrand

ing, operations and MicroBilt Corp., an outside contractor tapped to write the point-of-sale software. Klinger also wanted a plan that was far more detailed earlier in the process, and the opportunity to hold monthly meetings with the likes of Riordan and the president of MicroBilt.

All this rigor came as a shock to Anderson. However, learning to work with IS as a team gave him a tremendous feeling of accomplishment. "We felt like we were doing something that had never been done before," he says. "We decided that we were going to succeed or fail together, and we didn't have a meeting or make a decision without somebody from every group there. In fact, sometimes we thought we were going to lose our jobs together."

Tactics To Keep the Method Free of Madness

- **Maintain informal links** between project managers and businesspeople so that ideas can be hashed out.
- **Write a vision statement:** one crisp paragraph outlining the proposed system, followed by bulleted items enumerating system features and benefits. Cost estimates are optional (Klinger warns to "be wary of proposing costs too early"). Keep it brief.
- **Gather clients' opinions.** Use the vision statement as a springboard to provoke discussion among users.
- **Benchmark.** Send a group consisting of IS and business-unit people to check out similar systems at other companies. Based on what they learn, decide whether to drop the idea or move on to the next step.
- **Create a requirements definition.** Assemble a nascent development team (adding outside help, such as consultants, if needed), which will do a lot of digging and interviewing. "The final document should say, in business terms, 'Here's what we think is required to do the job outlined in the vision statement,' " says Klinger.
- **High-level design.** Here, formal permission to go forward is secured. The development team takes a broad, analytical look at the system's scope and objectives, weighed against its cost. Results should be shared with the business-unit employees for their sign-off.
- **Detailed design.** Heavy-hitting technical people join the team; equipment is selected. Again the team returns to the business unit for sign-off before proceeding further.
- **Build it.** Get a prototype out for people to use as soon as possible. "Real-life testing is unmatchable," says Klinger. After extensive tinkering, the system is rolled out.
- **Pick it apart in a post-mortem.** If you had to do it over again, what would you do differently?

Once the businesspeople at headquarters had signed on to the project for the duration, it was time to woo a second set of clients: the dealers. Operating independently of Ryder, the dealers were under no obligation to adopt the system. But getting them involved at the outset was important; their enthusiastic participation was deemed paramount for a successful implementation.

To build enthusiasm, the development team began singing the praises of RyderFIRST early in the project, setting up a dealer advisory council and piloting the system extensively at selected dealerships. After a dealership survey found that 50 percent of the dealers were computer-illiterate, Anderson and his team made sure that the test sites fairly represented that ratio. For example, one of the test sites belonged to a dealer who hadn't touched a keyboard of any kind since he mustered out of the Army in 1946. "That was the ultimate test," says Anderson.

Anderson also did a lot of stumping for RyderFIRST at dealer conventions, showing demos of the system and singing its praises. The proselytizing work paid off: Although Ryder predicted that 10 percent of its dealers would defect rather than accept RyderFIRST, the actual turnover rate was half that.

One explanation for the lower-than-expected turnover is that Klinger drew from his FIS experience to streamline implementation. He instituted a group of IS liaisons responsible for business change and switched them from the IS payroll to the rental-division payroll (which helped them identify more strongly with the people for whom they were building RyderFIRST). He also expanded to six days a week the hours of the technical-support hot line that had been set up for FIS (with some employees on call for the seventh day). He also added hot-line employees who were knowledgeable about consumer truck rentals.

PROJECT NO. 3

IS is now into its third major rollout: a PC-based integrated system that will convert many of the repair- and maintenance-shop functions of the commercial-leasing unit from a paper-based to an electronic system—much as RyderFIRST has done with the consumer-rental business.

As at the beginning of RyderFIRST, Klinger and his team had to convert a business leader to their intensive style of project partnering. Klinger says that his recruit, Tom Hjertquist, vice president of maintenance for Ryder commercial service and leasing, was initially skeptical of the process. "We were talking a lot more involvement than he was [anticipating]," Klinger says.

Hjertquist now has two maintenance managers working full time with systems on the projects and has weekly progress meetings with the team leader. "I'm getting to know just as much about what goes on in MIS as in maintenance," he says.

Although the project makes use of piecemeal efforts that have been in various pilot stages for several years, Hjertquist considers the maintenance-shop system to be the first phase of Ryder's companywide reengineering initiative; the system encompasses five of the 37 projects that Ryder's reengineering committee targeted for the overall effort. The fact that IS had been kicking around a skunkworks version of the project (in the form of a pilot it ran out of a maintenance facility in Nashville) made it relatively easy to bring the maintenance-shop system to implementation rapidly.

The five projects range from online repair manuals and automated parts ordering to a device called the "magic button"—a truck-mounted computer node that monitors the vehicle-refueling process.

In the past, a fuel bill circulated through several departments before arriving at the billing department at headquarters. Now an attendant touches a handheld computer to the button on the truck. The computer downloads all the pertinent customer information stored in the button, and the attendant simply enters the odometer number and the quantity of fuel. Data from the handheld device is downloaded every eight hours directly to the billing department. Not only does this eliminate several unnecessary routing steps, but the billing error rate has dropped by about 70 percent, Hjertquist says.

Ultimately, this implementation will demand even more business-unit participation than the two earlier ones, Hjertquist says. Because the entire system involves redesigned business processes as well as new technology, the maintenance group will conduct all training related to the business redesign. The IS group, however, will continue to coordinate the overall implementation.

Other tweaks to Klinger's methodology range from having a professor of ergonomics check the interfaces for user-friendliness to further modifying the involvement of field employees in the project rollout. The latter enhancement requires field employees to be trained in installation and implementation of the new system and then sent back to their original work areas to carry out the actual system installation. Once the implementation is completed, they'll resume their regular jobs in maintenance at that site. "That way," says Klinger, "they end up having to live with what they did."

Not all of Ryder's recent IS projects have gone through the crucible of Klinger's methodology. And he rues every instance of having allowed a client to abdicate ownership of the project. Without the clients' full involvement, he has learned, projects inevitably suffer from the lack of experience-based insight that IS can't always unearth if left on its own. "Even when we failed to ask the right questions," Klinger says, "[the client] would."

Surveying those examples of lost opportunity, he adds, "makes me even more of a zealot." CIO

TOM HJERTQUIST: *"I'm getting to know just as much about what goes on in MIS as in maintenance."*

PHOTO BY DEBORAH GRAY MITCHELL

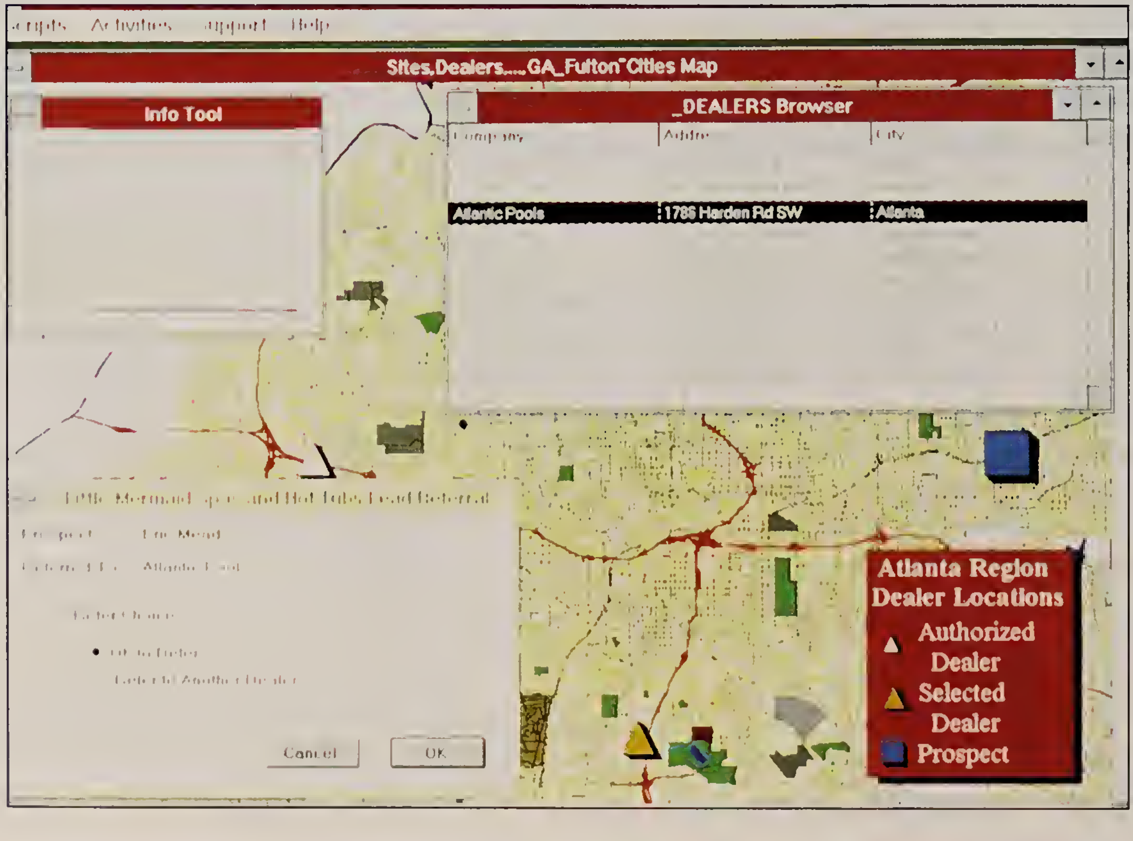
A Sense of Place

Want to know where the most new parents live? Prove your lending practices are fair? Prevent your customers from cheating you? Business geographics can help.

BY NORA SHERWOOD BRYAN

A major retailer is developing plans to open a new franchise in a large Midwestern city. The real-estate department is looking for a good property there—close to residences and other stores, and not too expensive. Marketing is analyzing the surrounding demographics so as to target the store's opening promotions accurately. Logistics is working out how to fit the new store into the distribution plan. Perhaps a consultant is looking for environmental "gotchas."

The common thread running through this complex scenario is geography. The phrase "location, location, location" applies to much more than real estate: Geography plays a role in many business decisions. It is an important consideration when locating stores, evaluating risk, developing sales territories, designing promotions, selecting areas to invest in, developing distribution networks, analyzing existing sales data and dealing with regulatory compliance. And the list goes on.



Company	Address	City
Atlantic Pools	1786 Harden Rd SW	Atlanta

A LEAD-REFERRAL *system from MapInfo locates product dealers when potential customers call.*

Geographic analyses were formerly restricted to what could be discerned by viewing a map; but computer advancements now permit routine application of digital geographic data to innumerable business problems. More and more organizations are coming to rely on geographic information systems (GISs)—more specifically, on a GIS subset called "business geographics" targeted at the private sector—to get a handle on the geographic components of running their businesses. Levi Strauss & Co., for example, uses a business-geographics system to match a store's product mix with its customers' demographics; the Chicago Tribune Co. employs one in developing new sales territories; and Arby's Inc. applies a GIS to site selection.

Industries have turned to business geographics for a variety of reasons. The banking industry, for example, uses mapping systems to respond to increasing regulatory pressures. The Community Redevelopment Act requires banks to demonstrate to regulators that their lending practices meet the needs of their market areas. Using a GIS, banks can compare deposits with loan approvals, factor in ethnic demographics, and—hopefully—show that they are approving numerous loans in areas where they do considerable deposit business, especially in areas with heavy minority populations. Mapping this data quickly shows compliance, or lack of compliance, with the rules. Essential Information Inc., a Washington-based public-interest group founded by Ralph Nader, recently used a business-geographics system from the Environmental Systems Research Institute Inc. to

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Some GIS Software Vendors

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Caliper Corp. Newton, Mass.	TransCAD, GIS Plus
DataMap Inc. Eden Prairie, Minn.	MarketPro
Environmental Systems Research Institute Inc. Redlands, Calif.	ARC/INFO, PC ARC/INFO, ArcView, ArcCAD
Genasys II Inc. Fort Collins, Colo.	GenaMap
Graphic Data Systems Inc. Maryland Heights, Mo.	GDS
Intergraph Corp. Huntsville, Ala.	MGE, MicroStation, FRAMME
MapInfo Corp. Troy, N.Y.	MapInfo
Strategic Mapping Inc. Santa Clara, Calif.	Atlas GIS, Atlas Pro, Atlas MapMaker
Tactics International Ltd. Andover, Mass.	Tactician
Unisys Corp. Blue Bell, Pa.	System 9
Urban Science Detroit	Market Smarts

NOTE: Many of these companies sell both software and data.
Source: Business Geographics *magazine*

illustrate its charges that mortgage lenders practice racial redlining in violation of the Fair Housing and Equal Credit Opportunity Acts.

Unprecedented losses from hurricanes, floods and fires over the last five years have forced property and casualty insurers to get serious about implementing business-geographics solutions quickly. Companies are improving the underwriting process by analyzing the risks of insuring particular clients based on their geographic proximity to hazards such as flood zones, faults and wind-prone areas.

Automobile insurers also find it makes sense to verify facts before issuing a policy. A recent study from the Industry Research Council shows that many Americans believe it is acceptable to underestimate the distance they drive between home and work—an important variable in calculating insurance rates. But with a home address and a work address, the distances can be verified using a business-geographics system. In addition, the insurance industry is under pressure from the government to prove nondiscriminatory policies. The regulations are similar to those imposed on banks, and insurers have also turned to GISs to demonstrate compliance.

The need for business geographics may be less clear-cut in industries outside of banking and insurance, but the possibilities are no less promising. Retailing is a case in point. Mass marketing is being replaced by "target marketing," "relationship marketing" and "micromarketing." The idea is to conserve advertising dollars by geographically targeting people with similar lifestyles and demographics.

As part of this trend, retailers are trying to match each store's product mix to the demographics of the likely shopper. Some neighborhoods buy baby clothes and minivans; others buy golf shirts and luxury sedans. Using almost any GIS, retailers can analyze the demographics and buying habits of certain areas and make detailed analyses of shopping patterns at "test" stores within those neighborhoods. They can develop an optimal product mix for these test stores, then modify the mix at branches in similar neighborhoods.

Business geographics is a computer technology with two critical components: mapping software and geographic data. Several hundred vendors sell GIS software products, and a comparable number sell data.

Two kinds of data live in the typical business-geographics system. The first is geographic features such as ZIP code-, census-tract- and administrative boundaries. Also included in this category are street files, which contain records of each block within a prescribed parameter, including street name, map coordinates and address ranges. One of the most widely used street files is the U.S. Census Bureau's TIGER (Topologically Integrated Geographic Encoding and Referencing)—a byproduct of the decennial census.

The second type, called attribute data, is just about any information—such as a customer-data file—that can be tied to a geographic feature. In the United States a wealth of attribute data is available, including business listings, demographic information, mailing lists and traffic volumes for particular areas. An entire industry caters to the needs of data-hungry business-geographic analysis. Many vendors take data from federal, state and local vendors and add value to it by correcting errors, updating information and/or presenting it in more-accessible packages.

Business-geographics systems come in many shapes, sizes and flavors. Most have a similar core functionality, but the user interface varies depending on what the system was designed to do. Until recently, many GISs were designed as generic toolboxes for use by anybody needing to analyze geographic data. Today, many GIS software vendors supply development tools that permit a user, systems administrator or even a value-added reseller (VAR) to create applications tailored specif-

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ically for the user's needs. Businesses can even buy highly customized applications from VARs.

Some GIS Data Vendors

COMPANY	PRIMARY PRODUCTS
American Digital Cartography Appleton, Wis.	street maps, geographic features
Business Location Research Tucson, Ariz.	street maps, traffic-volume data
Claritas/NPDC Alexandria, Va.	street maps, various demographics
Compusearch Toronto, Ontario	street maps, geographic features, various demographics
Donnelley Marketing Information Services Stamford, Conn.	geographic features, various demographics
Etak Inc. Menlo Park, Calif.	street maps
Equifax National Decision Systems San Diego	street maps, geographic features, various demographics
Geographic Data Technology Inc. Lyme, N.H.	street maps, geographic features, various demographics
Wessex Winnetka, Ill.	street maps, geographic features, various demographics

NOTE: Many of these companies sell both software and data.
Source: Business Geographics *magazine*

For example, an application customized to help a bank analyze compliance might bring up a screen that shows the bank's trade area, heavily outlined. Within the trade area, smaller areas—perhaps census tracts—are color-coded based on the number of deposits per tract. The system is connected to the bank's database, allowing it to automatically update deposit information.

If an analyst requests a trouble-spot map, the application would create an overlay of the census tracts using predetermined patterns of black markings to show loan-acceptance ratios. Blue census-tract areas overlaid with horizontal lines might indicate a high-deposit/low-acceptance-rate ratio; while a blue tract with vertical lines means a high-deposit/high-acceptance-rate ratio. The analyst can then print maps and geography-based reports straight from the system to include in a briefing packet for regulators.

In this case, the application has been customized to do what the user wants (perform a compliance analysis) in the right order (showing deposits, then loans, then making maps and reports) in the appropriate language (the legend reports deposit/loan acceptance ratios not the generic variable a/variable b).

Technology vendors have focused on making business-geographics systems easy to use. In addition, many GISs come in multiple versions for Unix workstations, DOS or Windows-based PCs, and Macintosh computers. The CIO's principal concern, then, will be making the technology work for the organization through streamlined data-sharing.

Many organizations are adopting an enterprisewide approach to get the full benefit from business-geographics tools. Consider the example at the beginning of this article. Each department involved in starting up the new franchise store has similar needs: to combine internal and external data with geographic information, and to analyze and/or visualize data against a map backdrop. The CIO must consider how these departments interact with one another and implement the system with an eye toward data-sharing based on these relationships.

Data-sharing issues can be grouped into two categories. First, data owned by one part of the organization could be useful to another within the context of its business-geographics activities. For example, an accounting department would maintain customer-billing information with an address for every customer. The marketing department may want to access those addresses and use an understanding of existing customers' demographics to gain additional customers. The challenge here is to leverage information that has been generated and maintained by one department, and that the department may feel it owns.

The second data-sharing issue emerges when business-geographics applications require data that doesn't really belong to any part of the organization but probably will be employed by most users. In the new-franchise example, both the site-selection people and the target marketers are interested in making maps that show the demographics of ZIP codes, with color shadings based on income, ethnicity and so forth. But nobody really "owns" the ZIP code data—it would probably be considered a corporate asset for everyone to use. In this instance the goal is to identify the appropriate data, bring it in-house and make it available to all who need it.

For the CIO in an organization taking an enterprisewide approach to business-geographics implementation, these data-sharing issues must figure into an IT architecture that fills all users' needs.

Nora Sherwood Bryan is vice president of publisher GIS World Inc., based in Fort Collins, Colo., and editor of Business Geographics *magazine.*

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FYI

Multimedia in the Cards

Ever wonder what your colleagues are doing when their office doors are closed? They could be watching the local news, playing an interactive game or even viewing a movie. They don't need a television; they just need a PC and ReelMagic, a multimedia PC card.

Sigma Designs Inc.'s CD-ROM product is based on the Motion Picture Experts Group (MPEG) compression standard, which can achieve compression ratios of 200 to 1. The MPEG standard enables high-quality video and audio to be played directly from a single-speed CD-ROM. The product will also support the upcoming VideoCD standard.

In addition to enabling users to view movies, television shows and other videos, Sigma's ReelMagic PC card can be used in educational and training applications as well as in public-information kiosks.

The PC card displays 32,768 colors at resolutions of 1,024 x 768 pixels at 30 frames per second—the same playback speed of standard televisions. Because the product performs decompression using an on-board processor that delivers simultaneous audio and video, synchronization problems are eliminated. The product's board attaches to a VGA-feature connector. ReelMagic also doubles as a PC sound card that supports both Windows and DOS sound standards. In addition, the product can coexist with a second sound card, thereby enabling users to add such features as recording.

The product costs $449 and comes with a five-year warranty. Call 510 770-0100 for additional information.

Mail Meisters

Having disparate mail systems within an organization can hinder communication and bog down operations. Users are often forced to log out of one program and into another with a different password just to notify accounts payable that timecards are ready, for example. Some new products now available can make sending and receiving messages much easier.

SoftSwitch Inc.'s Directory Xpress enables users to combine dissimilar E-mail listings, addresses and databases to create one directory on their companywide E-mail networks. The product designs and implements common listing and address directories so users can send and receive messages among multiple mail systems. Directory Xpress operates with cc:Mail, Lotus Notes, Microsoft Mail and other packages. Call 215 640-9600 for an evaluation and pricing.

Another package, Mosaic Works from Hitachi Computer Products America Inc., supports up to 10 E-mail agents and enables users to maintain a common E-mail directory across Unix, Macintosh and PC LANs. Mosaic Works monitors the systems for directory changes and sends that information to the product's directory server. Upon receiving the changes, each agent converts them to their native formats and updates their local E-mail directories, thereby giving E-mail users transparent access to all addresses. For more information on the $2,495 product, call 408 986-9770.

For-Profit Application

In these times of cost control, executives will be happy to know that there are applications to help them assess and improve the profit performance of their businesses, products, distribution channels and the like. Comshare's Commander Profit is a LAN-based application that enables users to investigate, analyze and forecast profitability and performance.

The product's profit-model component serves as a collection point for performance measurements and as a test bed for management analysis, plans and decisions. The information-integrator module provides access to such transactional systems as general ledgers and sales databases. A performance scoreboard lets managers compare actual performance to budgeted performance, locate sources of problems and fuel the next cycle of planning.

A Windows-based client/server application, Commander Profit costs $95,000 for up to 50 users. For information, call 313 994-4800.

Connect the Docs

A product that lets users link electronic documents with other applications is great. But one that also scans paper documents into those same applications is even better. Keyfile Corp.'s Doceo imports electronic documents such as spreadsheets and scans paper pages into a multipage, integrated document and includes them in an E-mail message or database application using Microsoft OLE.

Dynamic Data Exchange enables Doceo to communicate with 3270 emulators, development tools and other Windows applications. The product also features "Doclets," personal applications that help with the management of such tasks as fax distribution and expense-report creation.

Doceo, priced at $149, can be obtained by calling 603 883-3800.

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Tried and True

Preventive maintenance requires tracking the location, use and service of equipment in the field; parts inventories; contracts; customer records. When your equipment is used in the diagnosis and treatment of devastating diseases, you'd better get it right.

Downtime is an expensive nuisance in any line of business; in medicine, it's a matter of life and death. Ten years ago, Pittsburgh-based Medrad Inc., a manufacturer of vascular-injection systems and supplier of magnetic-resonance products to hospitals and clinics worldwide, began emphasizing preventive maintenance to ensure the fail-safe operation of its equipment and detect potential breakdowns before they occurred. This required tracking huge volumes of data, and in 1991 Medrad decided to automate its customer-service function. The old ledger-style administration practices couldn't cope with tracking the performance of over 8,000 units, a 7,000-part inventory, an expanding customer base and a growing variety of service agreements. Medrad needed to better coordinate its service operations and improve inventory management, repair-center operations and service management (tracking service calls, monitoring equipment performance and managing customer-data files and contract status).

"We had problems with independent databases, and the only accurate central file was the paper file," explains Jeff Thompson, service operations manager. "We wanted to go into much more depth in managing inventory in particular, but there was no way we could do major process improvement until we got ourselves on one system."

To facilitate these changes, Medrad implemented Dispatch-1, an integrated service-management system from Astea International of Chalfont, Pa. The system incorporates a relational database with software modules for such functions as logistics and distribution management, allowing Medrad to more closely monitor service operations and the service history of its equipment. It also helps the company control acquisition, deployment and movement of parts to service engineers out in the field.

"We now know the usage of each part,...and we have historic tracking of that usage," says Thompson. "We can tell where all our inventory is.... If we don't have it, we know [where] to find it, and we ensure that back orders are automatically allocated to the places they were requested."

The system has enabled Medrad to launch a Partnership Service Program with hospital clinical-engineering groups, in which Medrad assumes total responsibility for the fail-safe maintenance of equipment it manufactures and supplies. The program, which began a year ago, already generates 10 percent of Medrad's business. In the three years since Dispatch-1 came online, Thompson estimates that overall productivity in service operations has risen more than 30 percent. This contributed to Medrad's annual sales, which soared from $49 million in 1991 to $67 million in 1993.

Thompson describes the system as "an enabler. It's a tool that helps us establish processes. We have been able to capture more data...on how parts are used and deployed and...to instantly assess a client's equipment history and service record. Today, 93 to 95 percent of the time, when we make a service call we can be sure we have the right parts and avoid having to make a return visit. Eventually, we hope to push that success rate to 97 percent."

The bottom line: Medrad, with a staff of 700, has streamlined operations, improved productivity and cut costs without adding employees—except for a marginal increase in systems operating staff and a 15 percent increase in the number of service engineers to fulfill a boom in new service contracts. Last November, it was awarded the Greater Pittsburgh Total Quality Award by the Pittsburgh Chamber of Commerce. Thompson describes the company's success as "a team effort."

"The Dispatch-1 system has become integral in almost all of our major service business processes," says Thompson. "It's hard to think of anything in [service operations] that doesn't use Dispatch-1."

–Stephen Mills

Stephen Mills is a freelance writer based in Brooklyn, N.Y.

VITAL STATISTICS

Organization: *Medrad Inc., Pittsburgh*

Application: *Integrated customer-service system*

Sponsors: *Michael Kochis, director of equipment service; Beverly Prohaska, director of IS; Russell Evans III, vice president of sales and service*

Technology: *Dispatch-1 consists of a relational database and a variety of software modules; Medrad runs it on a Digital Equipment Corp. System 5000-240, networked to the corporate computer*

Scope: *Service operations, including logistics and distribution management, depot management and financial management*

Objective: *To better track parts and deliver maintenance, reduce costs, increase productivity*

Payoff: *Improved service operations, fewer equipment breakdowns, 30 percent productivity gain*

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“We were told it was impossible to develop a client/server application without extensive retraining. Then we talked to Micro Focus.”

Larry Lowder, Systems Architect, Questar Service Corporation.

Mountain Fuel Supply,® a division of Questar,® is a utility company supplying natural gas to 750,000 customers across Utah, Wyoming, Idaho and Colorado. The company's success is largely driven by its implicit belief that the customer is number one.

Yet, IT also plays its part in that success: client/server architectures and graphical user interfaces (GUIs) have helped Mountain Fuel Supply move applications and information closer to the customers and the employees. All of which has resulted in an augmented level of service being offered to customers.

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